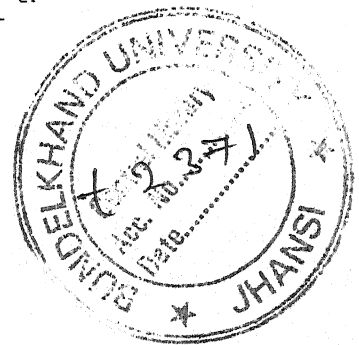
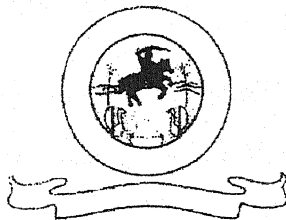


**"ROLE OF CO-OPERATIVE DAIRY ENTERPRISE
IN THE RURAL DEVELOPMENT THROUGH PARTICIPATION OF WOMEN
IN JHANSI DISTT.
OF BUNDELKHAND REGION OF U. P."
(AN ECONOMIC ANALYSIS)**

बुन्देलखण्ड क्षेत्र (उ०प्र०) के झाँसी जिले के ग्रामीण
विकास में सहकारी डेरी उद्यम की भूमिका एवं
महिलाओं की सहभागिता
(एक आर्थिक विश्लेषण)



**THE SIS
SUBMITTED FOR THE DEGREE
OF
DOCTOR OF PHILOSOPHY
IN
ECONOMICS
"BUNDELKHAND UNIVERSITY, JHANSI"**

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2006

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CERTIFICATE

This is to certify that the thesis entitled **“Role of Cooperative Dairy Enterprise in the Rural Development and Participation of Women in Jhansi distt. of Bundelkhand region of Uttar Pradesh (An Economic Analysis).”** submitted is fulfillment of the requirement of the degree of Doctor of philosophy in Economics of the Bundelkhand University, Jhansi is a record of the bonafide research work carried out by Ms Jyoti Yadav under my guidance and supervision. No part of the thesis has been submitted for any other degree or diploma. She has worked under my supervision for the said work more than 24 months. The suggestion and modification of R D C have also been in corporate in the thesis.


(C. B. SINGH)
Supervisor

P R E F A C E

This study entitled as **“Role of Cooperative Dairy Enterprise in the Rural Development and Participation of Women in Jhansi distt. of Bundelkhand region of Uttar Pradesh (An Economic Analysis).”** conducting during the year 2006 under the institute of Economics & Finance, Bundelkhand University Jhansi and is submitted as thesis in part fulfillment of requirement for the degree of Ph. D. (Economics).

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CHAPTER-1

Introduction

CHAPTER-1

INTRODUCTION

India is predominantly an agricultural country with about 70% of its population dependent on income from agriculture. Animal husbandry is an adjunct to crop agriculture and cattle and buffaloes are kept for milk production, motive power for various farm operations, village transport, irrigation, and production of manure. The animals are generally maintained on agricultural byproducts and crop residues. Mostly small and marginal farmers and landless labourers with holding size of 2-3 animals per farm household do animal rearing. Average land holding with these owners is very meager, being $\frac{1}{2}$ to 2 acres. Livestock rearing provides employment and supplementary income to the vast majority of rural households, the majority of who are landless and marginal farmers.

India had 204 million cattle and 84 million buffaloes. The total crossbred female population, including young stock was estimated to be about 10.6 million in 1992, of which the southern region accounted for about 45%. The share of other regions was: northern (25%), eastern (20%) and western (10%). In areas where crossbreeding is getting popular, the population of low producing *desi* cows is declining. The density of bovine population varied as per land area, agricultural conditions, availability of feed and fodder

and socio-economic conditions. On an average 100 ha of cropped area sustained 151 bovine comprising 111 cattle and 40 buffaloes. Stocking rate differed significantly in different regions. The cattle density per 100 ha of cropped area was highest in the eastern region (182) and lowest in the northern region (90) whereas reverse was true for buffaloes (52 in northern and 26 in southern region).

Cattle were fairly distributed all over the country (18-31%). The concentration of buffaloes was highest in northern region (46%) and lowest in eastern region (11%). The productivity per animal between regions varied due to quality of cattle and buffaloes and availability of inputs as especially feed and fodder.

The gross value of output from livestock sector alone at current prices was about Rs. 1114 billion (1997-98), which is about 25% of the value of the output of Rs. 4495 billion from agriculture sector. This excludes the contribution of the animal draught power. Milk alone contributed around 63% to the total output from livestock. Cattle and buffaloes in addition to providing much needed milk and to some extent meat play an important role in utilization of agricultural by-products, which are non-edible to human beings. They also provide raw materials/ by-products such as hides and skins, blood, bone, fat and casings for industrial use. Farm manure is a useful income generating products of the sector. Animal power for transportation and agricultural operations, particularly in rural areas also makes a significant contribution.

A marginal increase in milk production from 17 million tones in 1995-51 to 22million tones in 1970-71 was achieved. The increase,

however, was large between 1980-81 (31.6 million tonnes) and 1990-91 (53.7 million tonnes). The production of milk for the year 1998-99 was 74.7 million tonnes which would make per capita availability to be 2 12 g per day against the recommended level of 220g. This enhanced growth in milk production is because of various cattle and buffalo development programmes and large scale crossbreeding indairy cattle.

Around 70.6 million draught animals (mostly cattle and buffalo) contribute 20% of the energy input into crop farming. Although contribution of draught (DAP) sharply reduced from 72% in 1961 to 23% in 1991 mainly due to mechanization, the requirement of DAP shall continue to be around 20% in years to come.

A large increase in buffalo meat production both for internal consumption and export has been noted in the last few years. The export of buffalo meat went up from 101,666 tonnes valued at Rs. 2,808 million in 1995-96 to 176,329 tonnes valued at Rs. 7,293 million in 1997-98. This export is going to go up in view of establishment of export abattoirs and improvement of existing abattoirs. Considerable export earnings are obtained from export of animal by-products.

Artificial insemination network in addition to providing semen of indigenous cattle and buffalo breeds and crossbred cattle is also used for dissemination of semen of temperate dairy cattle through crossbreeding to increase milk production. To meet the semen requirement, sires of various cattle breeds maintained at the main

germplasm units some of which also have the facilities of deep freezing of semen. Improvement in cattle and buffalo production is also directed at improvement through feeding, generation of marketing facilities, advisory service and veterinary aid.

Institutional structures funded by government also exist. These maintain herds of cattle and buffalo, which act as nucleus or multiplier herds for purposes of training and research. Some farms have been established for production quality bulls and undertaking progeny testing programmes for some important indigenous breeds. Large government herds like military dairy farm also exist for commercial milk production. These herds are being used for developing new dairy breeds and for spreading superior germplasm to rural areas for improvement of native cattle.

The operation flood (FO), which has been implemented in three, phases over 26 years covers some nine million-farmer families in 170 milk – sheds in 22 states union territories under co-operative umbrella. The operation flood programmed also provides animal health, breeding and marketing facilities. It also available compound and other feed and related technologies for improved cattle and buffalo productivity.

The advances in animal husbandry, in general, and dairying (crossbred cattle and buffalo) in particular have greatly helped in improving the economic status of rural population in India. The availability of crossbred dairy animals and high producing buffaloes has made dairying a remunerative business. Crop and dairy enterprise combination among various livestock is best suited for most of the

areas. Milk production through crossbred chattel has led to increase in income of the farmers in almost all the regions of the country including drought prone, dry land and rainfed areas. Dairy enterprise was on the top with regard to profit in marginal, small and medium category of farmers.

The organized dairy industry in India is estimated at INR 345 billion (US\$ 7 billion) and is expected to witness a CAGR of over 7% over the next four years, to reach a size of INR 460 billion (US\$ 9 billion) by 2005. India offers several attractive features to players interested in coming to the country. Free regulatory regime, providing equal opportunities for domestic as well as foreign players.

-Huge scope for growth - organized industry accounts for than 15% of milk produced in India. The rest of the milk is either consumed at farm level, or is sold as fresh, non-pasteurized milk through unorganized channels. The share of organized industry is expected to rise rapidly especially in the urban region.

-Large growth expected in consumption of packaged dairy products due to several demographic factor, including increased affordability, increased number of nuclear families and working women and rising exposure to western dairy products, as well as packaged dairy products such as youngsters and UHT milk .The rise in the market for ethnic products is likely to witness the fastest growth at over 20-30 per annum.

-The emergence of organized food retail chains has led to greater availability of self-space for chilled/frozen dairy products, which is expected to boost growth in sales of packaged dairy

products. Organized food retail in India is expected to grow from INR11 billion (USD 230 billion) to INR 110 billion (USD 2.3 billion) by 2006.

-Some of the major international dairy companies, which have already established operations in India, are, include Nestle, Unilever (through Hindustan Lever Ltd.) Danone (through Britannia) and nutrition. Britannia has recently entered into an alliance with Fonterra for accessing technology and providing market access to Fonterra. The Britannia-Fonterra alliance has heightened other Indian companies' need for securing international partnerships in order to remain competitive and this is an opportune time for international dairy companies to establish alliance-led entry into the Indian market. While evaluating the potential partners in India, the new player would need to consider parameter such as management fit, quality of procurement infrastructure (and therefore additional investment that would be required in up grading the milk quality) product capabilities and strength of brand and distribution network.

The larger cooperatives, such as APDDCF provide a large processing capacity, and an established national brand and distribution network for foreign companies envisaging entry into India. On the other hand, smaller private sector players such as Hatsun Agro Nilgiris and Vadilal provide processing capacity, good management fit, strong regional brand and distribution network to a new entrant.

The key product segments that would be attractive to new players include ethnic products like curd, panner and ethnic sweets

and infant milk products. These products face low competition and are expected to witness very high growth rates.

GLOBAL DEMAND AND SUPPLY

India is the largest milk producing country. Contributing over 80 million MT to the total world milk producing of 574 million MT. The global demand for milk and milk products has been growing consistently and is expected to grow at approximately 2% per annum over the next five years. Maximum growth in demand is expected in Asia, with most Asian regions expecting growth of 3-4 percent per annum. Middle East and North Africa are also expected to witness growth rates of 2-3%.

As against the expected demand growth of 2% production has been growing at a marginal rate of 1 % and is therefore, expected to lag behind demand. The low growth rate in production is primarily due to the decline in production in Western Europe (CEEC+CIS). On the other hand, production is increasing in regions such as South Asia, South America and Oceania. In 2000 South Asia became the second largest production region in the world, following Western Europe.

Use of milk varies vastly across different regions in the world. It is important to understand the differences in order to identify key markets for dairy export. In general the production of cheese has witnessed the greatest growth over the last four years.

DAIRY POLICY STRUCTURE

The dairy industry has been one of the most heavily subsidized and protected industries in the world. The EU's dominance in dairy is primarily due to subsidy and encouragement it has received from the EU commission. However, it is expected that this protection will diminish drastically in the near future as a result of various factors the prime ones being.

- WTO pressure-this is likely to reduce import tariffs. Provide minimum market access and lower export subsidies.

- The entry of the EU applicants Poland, Hungary, Czech Republic, Estonia and Slovenia will put additional pressure on the funds available for subsidies. The new members will increase the EU milk supply by 11%, while more than doubling the number of dairy farmers.

The US dairy policy is also likely to be liberalized, with reduced price support from the government and relaxation of import restrictions.

WORLD TRADE PATTERN

World trade in dairy products is cheese, skimmed milk powder (SMP), Whole milk powder (WMP) and butter. World trade in cheese has witnessed high growth rates in the recent past. While the deficit regions have a self-sufficiency of less than 100%, the surplus regions

self-sufficient of over 100%. Western Europe for example, has 110% self-sufficient, which means it has a 10% surplus after meeting its own requirements. The EU plays a dominant role in the world dairy trade. Nevertheless, its share has been declining in recent years; from 53% in 1995 to 40% in 1999. The key gainers in world trade have been New Zealand (from 19% to 25%), Australia (from 13% to 19%) and Argentina (from 3% to 6%).

CONSOLIDATED WAVE

The trend towards a growing demand supply gap and improved market access are increasing the world trade in dairy products. These factors have also led to an increasing number of companies trying to acquire global operating platform. In the period January 1998 to, November 2001, there were 548 mergers and acquisitions in the dairy sector. European companies led the great majority of alliances. European companies have been the acquirers in 70% of the 548 deals. Asia, on the other hand, figures in only about 15 deals.

DAIRY CONSUMPTION IN INDIA: -

Key products and expected market sizes

The organized dairy industry is estimated at INR345 billion (USD7 billion) and is expected to witness a CAGR of over 7%

during the next four years reaching INR 460 billion (USD 9 billion) by 2005. The main dairy products being sold in India can be categorized in to two types:

HIGH GROWTH PRODUCTS: -

These are primarily products that have been traditionally prepared at home or bought from the unorganized sector. Owing to various demographic changes in Indian society described later, consumer preference is shifting to branded, packaged versions of the same products. Such products include liquid milk and ethnic Indian dairy products.

The high growth category also includes certain products such as cheese and infant milk foods that are expected to grow at high rates on the back of huge market development and quality improvements made by markers.

MATURE PRODUCTS-

These products are likely to witness low –medium growth rates, and include products such as milk powder and condensed milk.

LIQUID MILK: -

As mentioned earlier, about 45% of the total milk produced is consumed as liquid milk. This market is estimated at 36 million MT,

and valued at INR 470 billion (USD 9.8 billion). Owing to the preference of many consumers for non- pasteurized milk, which is perceived to be fresher than pasteurized (packaged) milk, over 80% of the milk sold in urban areas is non –pasteurized milk from the unorganized sector. Packaged, branded milk accounts for liquid milk is growing at about 4% per annum. In the recent past, as a result of rising awareness about poor hygiene standards and much adulteration of loose milk, consumers in urban area began switching to packaged milk and this segment is expected to grow at over 8% per annum.

Packaged liquid milk offers a huge opportunity to dairy players, because a large population still consumes loose milk. Consumer education about the problems associated with loose milk needs to be stepped up. Given that liquid milk players operate on thin margins and are reluctant to spend large sums on consumer marketing and education, it is imperative that various milk players from associations to undertake educational campaigns.

The activities of liquid milk players are mainly limited to particular cities or regions because the limited shelf life of pasteurized milk restricts their geographical reach. This segment is dominated by various cooperative.

INDIAN DAIRY PRODUCTS: -

Ethnic sweets: this is the largest segment in Indian dairy products, estimated at INR 130 billion (USD 2.7 billion). The segment is dominated by organized sweet shops selling sweets in loose form. Ethnic sweets are also made at home and are consumed as snakes. The segment has been sporadic efforts by the organized sector from players such as Haldirams and Chhappan Bhog are primarily Indian snake players and have extended their presence in to packed sweets.

Paneer or cottage cheese is made almost exclusively at home. Small dairies in the unorganized sector also make it. A few dairy cooperatives and private sector dairies sell branded paneer in urban areas, such as Nilgiris, Amul, Nandini and Vijaya.

CURD / BUTTERMILK/LASSI: -

This is a popular dairy product in India and is associated with tremendous Nutritional benefits. Like other Indian dairy products, it is prepared and consumed at home, which account for 75% of the 5000 MT consumed per day and bought at organized sweet shops or restaurants. Some cooperatives have been selfing this product under regional brand names. The product is packed in plastic pouches or cups but has a short shelf- life. The recent entry of Amul, Nestle and

Mother Dairy in to the market with curd that has a longer shelf life is multiplying the size of the market.

SHRIKHAND: -

This is sweetened, flavored curd. Popular primarily in West India, its market, estimated at 7000 MT, is dominated by Amul. Several regional brands such as Warana and Aarey are also significant.

This segment of Indian dairy products offers a huge growth opportunity because the Indian consumer is becoming more aware of the low hygiene standards and risk of contamination in ethnic sweet shops. Concurrently, changing demographic patterns in India suggest women will have less time to prepare sweets at home. As a result packaged, branded traditional dairy products are experiencing rising demand and increasing acceptance, especially among urban consumers. The success of the branded curd launched by amul suggests the potential for introducing other such products at economical prices to capture mass markets.

CHEESE: -

The cheese market is estimated to be 9000 MT and valued at INR 1.8 billion (USD38million). Cheese is primarily consumed in urban areas, with the four main metropolitan cities accounting for

over 50% of total consumption. The key players are G CMMF (Amul), APDDCF (vijaya) and Britannia. Recent launches include some French players such as Bongrain and Fromageries Bel (Laughing Cow). The cheese market is witnessing fierce competition and marketing activity. Growth rates are expected to be more than 15% per annum.

The only cheeses with mass markets in India are processed cheddar and mozzarella. Most other varieties are imported and have very small markets.

BUTTER: -

The butter market is estimated at over 50,000 MT and valued at INR 6.5billion(USD135million). It is growing at 7-8% per annum. This market is more fragmented than the cheese market. However Amul still has the lion' share of the national market and other cooperatives have large shares in their regional markets.

BUTTER OIL (GHEE): -

Butter oil or ghee, is used as a premium cooking medium in most Indian household. The ghee segment is large at about 1.5million MT and is an overcrowded segment: almost all the dairy plants in India manufacture the product as a means of using the fat remaining after processing liquid milk. The segment is witnessing low growth

rates of less than 5%; the product is used as a cooking medium and is substituted by edible oils when its prices are high.

MILK POWDER: -

The total market for milk powder is estimated at 100,000MT. SMP accounts for 70% of this market. The segment is dominated by cooperatives, which together have a 40% share of the market. Amul dominates the WMP segment with 65% market share. Manufacturing demand from biscuit and ice cream companies takes up 70% of total market.

INFANT MILK FOODS: -

The infant milk food segment is estimated at 110,000MT and valued at over INR 25 billion (USD521million). The segment is dominated by Nestle. Other important players are Heinz and Amul. The segment is expected to be on the verge of witnessing rapid growth with the recent entry of Nutricia is planning the launch of several new infant food formulae.

ICE CREAM: -

The total market for ice cream is estimated at INR 11 billion (USD229). The Organized sector accounts for over 50% of the

market (approx. INR 6million or USD125million). Per capita consumption is low at about 106 ml per year. The key player is Hindustan Lever Ltd (Kwality Walls) with a 50% share of the market. Amul is the second largest player, followed by Vadilal, Arun and Mother Dairy. This segment is also has some strong regional brands such as Arun (Hatsun Food) in Chennai. Joy in Bangalore, Nirula's in Delhi and Metro and Rollicks in Calcutta.

The ice cream segment is also witnessing strong growth of 15-20% per annum. The strongest growth is expected in the economically priced softy cones segment. Several players are in the race to establish a national network of dispensing machines. At the other end of the market, players such as movenpick (own retail outlets), Blue Bunny (sold through select retail outlets) and Baskin Robbins (own retail chain) are targeting the niche, premium segment within ice cream.

OTHER PRODUCTS: -

These include products such as dairy whitener (48,000 MT), condensed milk (11,000MT) and flavoured milk (5000MT) and are likely to remain marginal product categories.

DEMAND DRIVERS: -

The demand for packaged dairy product is expected to rise very rapidly on the back of both supply and demand-related factors. On the supply side, several new players have emerged with new product offering, promising better quality and convenience to the consumer. Moreover, the increased competition in the sector is prompting players to enhance their efforts to develop the market. This has resulted in greater awareness and levels of acceptance for packaged dairy products among Indian consumers.

On the demand side, several factors are causing a shift towards the consumption of packaged ethnic dairy products- and some Western dairy products. These factors include: - Increased affordability of packaged dairy products- approximately 30% of the Indian population resides in urban regions and over 25% of the urban population has a monthly household income of over INR 5,000 (USD 104). This represents a large target group.

- Higher propensity to try new products – projected age distribution of Indian consumers shows a steadily rising percentage in the 20-34 age group, the age group that is the most receptive to new products. This age group is projected to increase from 247 million in 2001 to 312 million 2010. This is a percentage increase from 24% to 27% of the total population.

- More nuclear families and workingwomen, giving women less time to prepare dairy products at home. In urban India about 80% of women live in nuclear families. This percentage is higher (83-85%) in the more developed cities such as Mumbai, Bangalore and Chennai and lower (about 75%) in smaller cities such as Jaipur and Surat. Over 30% of the women in nuclear families in urban India work. This percentage is higher in the larger and more developed cities and is expected to rise as other demographic changes take place in Indian society.
- More Indian traveling abroad and being exposed to packaged dairy products, like yoghurts and UHT milk. The number of outbound Indian tourists rose from 3.5 million in 1997 to 4.8 million in 2000. The number is expected to rise at a CAGR of over 25% during the next four to five years. Furthermore, the emergence of organized food retail chains has led to more shelf space for chilled and frozen dairy products. This too, will lead to growth in the sales of packaged dairy products. Organized food retail in India is expected to grow from INR 11 billion (USD 230 million) to INR 110 billion (USD 2.3 billion) by 2006.

CONTRIBUTION OF LIVESTOCK TO THE NATIONAL ECONOMY:

India accounts for a significant share of world's livestock resources with nearly 57 percent of world's buffaloes, 16.2 percent of

cattle, 16.2 percent of goats, 5.7 percent of sheep and 5 percent of poultry (FAO, 2004). Though the contribution of agriculture and allied sectors to the national gross domestic (55 percent in the early 1950s to 39.5 percent in 1981-82 and 23.9 percent in 2001-02), livestock sector has been among the few high- growth sectors in rural India. The importance of livestock sub-sector can be gauged from the contribution it makes to the national economy. Livestock sector accounted for 25.5 percent of agricultural GDP, and about 5.6 percent of total GDP in 2001-02. The share of livestock in the gross value of agricultural outputs (at 1993-94 prices) has increased from 18.6 percent in 1971-72 to 35.5 percent in 2001-02 (CSO, 2003). The dairy sector contributes the largest share in agricultural GDP. The large contribution that livestock sector makes to the national economy is a reflection of multiple roles that livestock plays in the farming systems in the country.

The growth in value of output of major livestock products in the country at 1993-94 constant prices over the last five decades. The total livestock output has increased more than four times in the last five decades. According to the Central Statistical Organisation (CSO) estimates, the gross value of output from Rs. 20,856 crores in 1950-51 to Rs. 88,331 crores in 2001-02 (CSO, 2003). The dairy and poultry are high- growth sectors and is reflected in the growing importance of the contribution of these sub-sectors in the livestock economy. While output in dairy sector increased by 11.2 times and poultry meat by five times. The wool and hair, and dung are the slow-growth sub-sector. The share of milk group in total value of

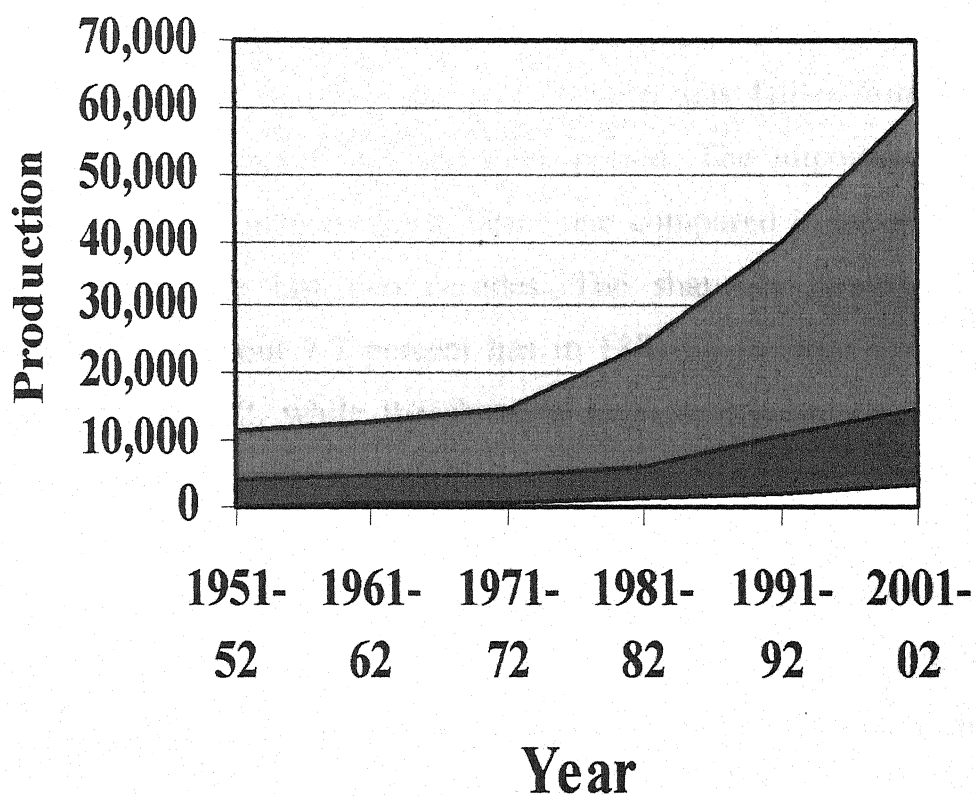
**Table 1:1, Value of output (Rs. crores) and share(precent)of major production
in total value of output from livestock sector(at 1993-94 prices)**

Group	1951-52	1961-62	1971-72	1981-82	1991-92	2001-02
[1]	[2]	[3]	[4]	[5]	[6]	[7]
1- Milk group	11,399	12866	14,864	24,301	40,018	60,340
	[55.4]	[54.9]	[58.1]	[62.3]	[65.7]	[68.3]
2- Meat group	4,290	5,031	4,890	6,356	10,702	14,876
	[20.8]	[21.5]	[19.1]	[16.3]	[17.6]	[16.8]
2:1- Poultry meat	927	1,354	1,066	2,027	4,172	5,902
	[4.5]	[5.8]	[4.2]	[5.2]	[6.9]	[6.7]
3- Eggs	269	386	543	1,041	2,045	3,149
	[1.3]	[1.6]	[2.1]	[2.7]	[3.4]	[3.6]
4- Dung	4,495	5,040	4,862	5,772	6,207	6,546
	[21.8]	[21.5]	[19.0]	[14.8]	[10.2]	[7.4]
5- Others	133	98	412	1,540	1,917	3,419
	[0.6]	[0.4]	[1.6]	[3.9]	[3.1]	[3.9]
Total livestock	20,586	23,421	25,571	39,010	60,889	88,380
	[100.00]	[100.00]	[100.00]	[100.00]	[100.00]	[100.00]

Source: CSO (2003, various issues).

Figure in parentheses show the percentages to the total value of output from Livestock secto.

Value of Output from Livestock Sector



■ Milk Group ■ Meat □ Eggs

Figure 1:1

output from livestock sector has increased from about 55 percent in 1951-52 to over 68 percent in 2001-02 (Table-1: 1). The share of meat sector has declined from 20.8 percent to 16.8 during the same period but the share of poultry sector (meat and eggs) has increased from 5.8 percent to 10.3 percent. The share of dung (fuel and manure) has declined significantly from 21.8 percent in 1950-51 to about 7 percent in 2001-02. The use of dung as fuel has declined significantly from 12.3 percent in early 1950s to nearly 4 percent in 2001-02, while the share of dung as source of manure has fallen from 0.9 percent to 0.25 percent over the same period. The importance of poultry sector has increased at a faster rate compared to other sub-sectors during the last two decades. The share of poultry has increased from about 7.7 percent in 1981-82 to little over 10 percent in 2001-02, while the share of meat sector has remained almost constant.

The value of output from livestock sector grew at an annual compound growth rate of 3.12 percent between 1950-51 and 2001-02, ranging from 0.72 percent in the sixties to 4.77 percent in the 1980s (Table-1: 2). Among all livestock products, eggs witnessed the highest growth (5.37 percent), followed by poultry meat (3.94 percent), and milk growth (3.65 percent). The wool and hair sub-sector registered a negative growth. All livestock sub-sector registered the highest growth during the decade of 1980s except for meat products and dung, while in 1990s there was deceleration in growth in all sub-sector is mainly attributed to the successful implementation of the Operation Flood and other dairy development

Table-1:2, Annual compound growth rates in value of output(at 1993-94 prices) of different livestock products, 1950-51 to 2001-02

Commodity	1950-51- 1960-61	1961-62- 1970-71	1971-72- 1980-81	1981-82- 1990-91	1991-92- 2001-02	1950-5 2001-0
[1]	[2]	[3]	[4]	[5]	[6]	[7]
1- Milk group	1.13	1.11	4.9	5.19	4.27	3.65
2- Meat group	1.51	-0.36	2.99	5.22	2.67	2.56
2.1-Meat	1.64	-0.43	3.34	6.26	3.38	2.79
2.1.1-Mutton	0.93	0.03	0.09	5.02	1.53	1.78
2.1.2-Poultry meat	3.77	-4.12	7.49	7.71	3.82	3.94
2.2-Meat product	0.98	-1.64	6.52	1.58	2.55	1.91
3- Eggs	3.84	4.48	6.16	7.55	4.04	5.37
4- Wool and hair	0.52	0.39	-9.81	2.75	3.98	-0.23
5- Dung	1.01	-0.53	1.63	1.06	0.75	0.8
5.1-Dung fuel	1.09	-1.53	1.58	1.72	0.45	0.95
5.2-Dung manure	0.96	229.4	1.66	0.55	0.99	0.67
All livestock	1.51	0.72	4.12	4.77	3.72	3.12

Source: Computed from National Statistics,CSO

Different Livestock Products

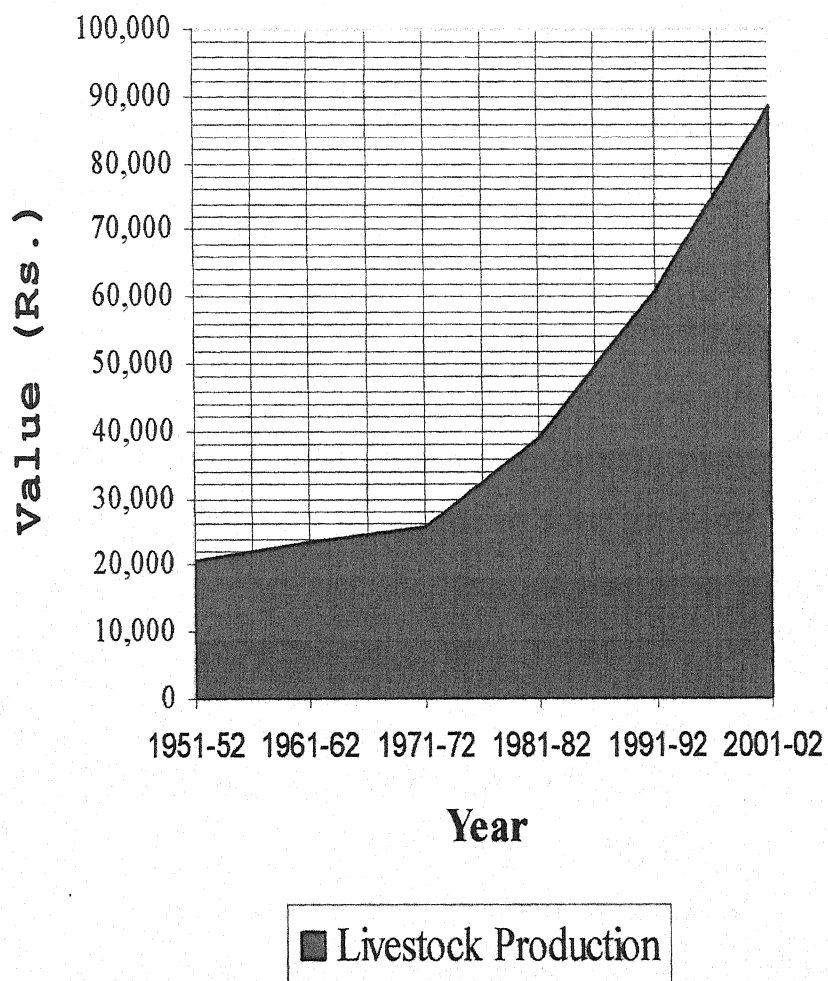


Figure 1:2

programmes implemented by the central and the state governments, while growth in poultry sector can be attributed to a large part to the private poultry industry initiatives. The development of poultry industry in India within a span of just two decades is remarkable. From rural backyard poultry production catering to the domestic market prior to the 1980s, the sector has transformed itself into advanced industrial production in some states.

GROWTH AND COMPOSITIONAL CHANGES IN LIVESTOCK POPULATION: -

BOVINE POPULATION: -

The livestock population in the country increased from 292.8 million in 1951 to 485.39 million in 1997 at annual growth rate of nearly 1.1 per cent but the total livestock in the country has decreased to 482.78 million in 2003 showing an overall decrease of 0.54 per cent (annual compound growth rate of -0.09 per cent) (Government of India, 2004a). There were some changes in the composition of livestock in broad groups like bovine, ovine and other livestock during the last four and half decades. The proportion of bovines (cattle and buffaloes) declined from nearly 68 per cent in 1951 to 58.8 percent in 2003 whereas the proportion of bovines increased from 29.5 per cent to 37.7 per cent between 1951 and 2003. The cattle population, which accounts for nearly 66 per cent of

Table-1:3, Trends in livestock population in India, 1951-2003

	1951	1956	1961	1966	1972	1977	1982	1987	1992	1997	2003[P]
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Total cattle	155.3	158.7	175.6	176.2	178.3	180	192.45	199.69	204.58	198.88	187.38
Adult femal cattle	54.4	47.3	51	51	53.4	54.6	59.21	62.07	64.36	64.42	-
Total Buffalo	43.4	44.9	51.2	53	57.4	62	69.78	75.97	84.21	89.92	96.62
Adult femal buffalo	21	21.7	24.3	25	28.6	31.3	32.5	39.13	43.81	46.77	-
Total bovine*	198.7	203.6	226.8	229.2	235.7	242	262.36	275.82	289	288.74	284
Sheep	39.1	39.3	40.2	42	40	41	48.76	45.7	50.78	57.49	61.79
Goat	47.2	55.4	60.9	64.6	67.5	75.6	95.25	110.21	115.28	122.72	120.1
Other	7.8	8.3	7.5	8.3	10.2	10.4	13.22	13.55	15.8	16.44	16.89
Total livestock	292.8	306.6	335.4	344.1	353.4	369	419.59	445.28	470.86	485.39	482.78
Share(percent) of bovines in total livestock	67.9	66.4	67.6	66.6	66.7	65.6	62.5	61.9	61.4	59.5	58.8
Poultry	73.5	94.8	114.2	115.4	138.5	159.2	207.74	275.32	307.07	347.61	440696
Density/ha of net sown area	2.45	2.34	2.48	2.51	2.58	2.6	2.99	3.32	3.3	3.42	-

Source: Government of India (2004 a).

Note:* Total bovine includes cattle and buffaloes only; P:provisional.

! Annual compound growth rate (ACGR) is calculated using the formula: $P = \text{Livestock population in period } t$,

Livestock Population in India

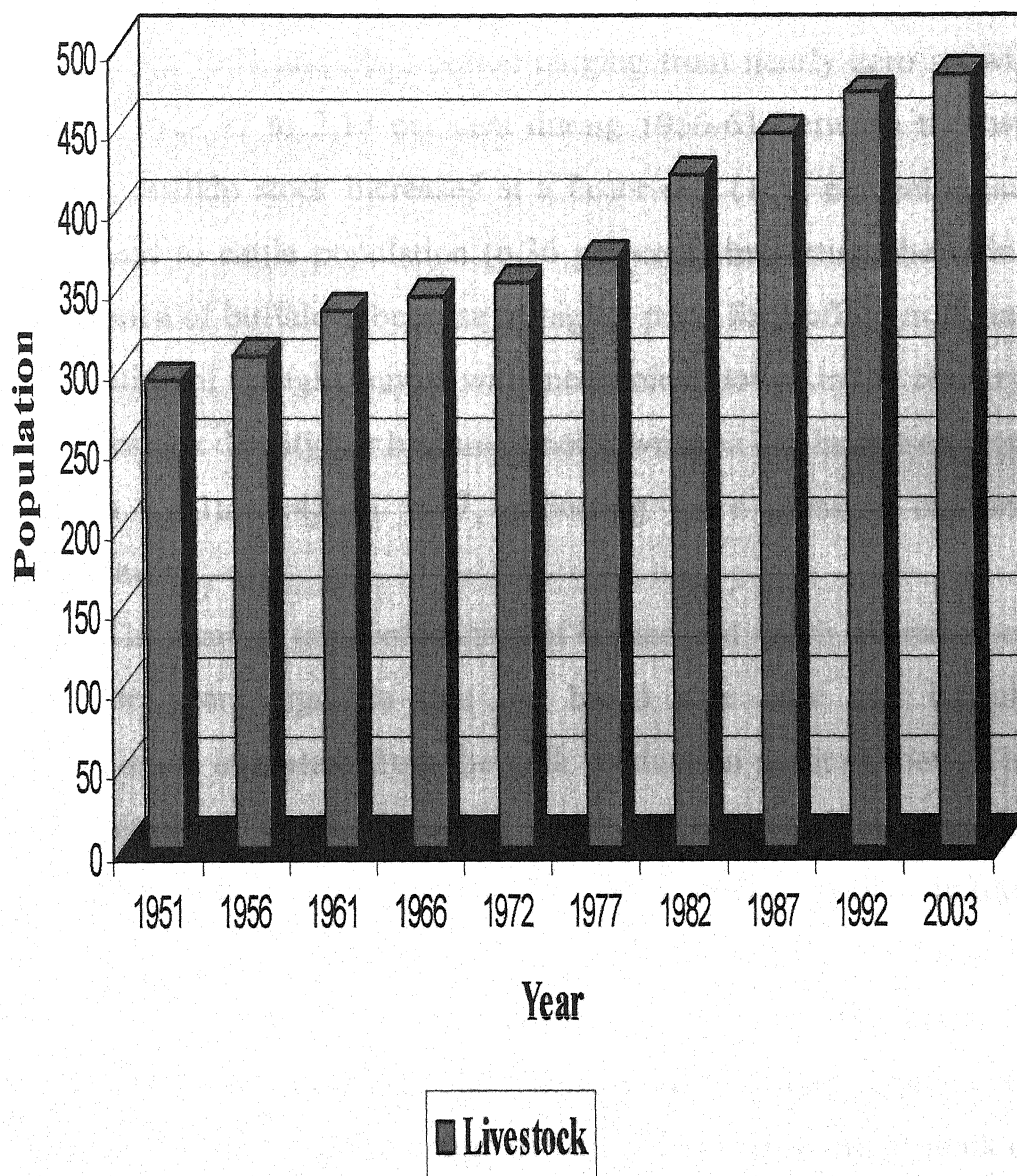


Figure 1:3

bovine population and about 39 per cent of total livestock population showed a declining trend. The share of other animals like ponies, horses, mules, donkeys, camels and pigs increased marginally from 2.7 per cent to 3.4 per cent. The population of the bovine stock consisting of cattle and buffalo increased at a rate of 0.69 per cent per year during 1951 and 2003 period ranging from nearly zero growth during 1992- 97 to 2.18 per cent during 1956-61. Between the two species, buffalo stock increased at a faster rate (1.55 percent/ year) compound to cattle population (0.36 per cent) indicating the rising importance of buffaloes because of higher price for buffalo milk and substitution of draught animal with mechanical power in the country . The livestock density per hectare of net sown area has increased from 2.45 in 1951 to 3.42 in 1997, indicating more pressure on land resources.

The trend in the composition of bovine and milch animal stock over the years signifies that the breed able cow and buffalo population is important from the milk production point of view. The composition of bovine breeding stock has improved in terms of increased share of in-milk animal in breeding stock as well as in total adult females. While adult females among cattle account for about 32 percent of the cattle stock, and in case of buffaloes, it is about 51 percent of the buffalo stock. The rise in buffalo numbers is seen even more clearly in terms of the ratio of buffaloes to cows in the stock of adult females, or the milch animal. This ratio of milch buffaloes to milch cow increased from 0.46 in 1951 to 0.50 in 1966, 0.58 in 1977 and then to 0.73 in 1997. In other words, the trends in ovine stock

indicate that there is an increasing shift to milk production as a major objective of rearing of bovines in India agriculture.

The trends in the animal growth rates of livestock population over the period 1951-97 have show that the livestock population grew at annual average compound growth rates of 0.97 percent between 1951 and 2003, ranging from 0.44 percent during 1966-72 to 2.57 percent during 1977-82. The results show that population of in-milk bovine consisting of lactating buffaloes and cows has increased at a faster rate and growth rate has accelerated over time since the mid-sixties and then again declined between 1987 and 1997. A comparison of growth rates of cattle and buffalo population show that buffalo population in India increased at a faster rate than cattle population during all the inter-census period except for 1977-82 and 1982-87. The incentives, apparently, took longer time to effect cattle stock than in the case of buffaloes.

INVESTMENT PATTERN: -

One of the indicators of a sector's importance is the budget allocation to that sector. In the investment pattern in livestock sector during various plan periods the plan outlay (at current prices) of the central and centrally sponsored schemes under animal husbandry and dairying has increased from Rs. 22 crores in the First Plan to Rs. 1,545.64 crores in the Ninth Plan and Rs. 1,735 crores in the Tenth Plan. The outlay for dairying increased from Rs. 7.81 crores in the

Fist Plan to Rs. 900 crores in the Eighth Plan and then declined in the Ninth Plan to Rs. 469.5 crores and Tenth Plan to Rs. 355 crores. Though the allocation increased in nominal terms, the allocation the animal husbandry and dairying as percentage of total plan allocation has declined since the Fourth Plan and reached a low level of 0.11 percent during the Tenth Five Year Plan. In most cases the bulk of the budget is eaten up by wages and other administrative costs of the government departments. Although the livestock sector occupies a pivotal and its contribution to the agricultural sector is the highest, the plan investment made so far do not appear commensurate with its contribution and future potential for growth and development. There is a need to increase investment in the livestock sector.

CO-OPERATIVE MOVEMENT OF DAIRY: -

MILK PRODUCTION: -

The farmer cooperative movement, popularly called operation Flood, has been responsible for the milk revolution in thee country. The movement helped by improving farmer returns on milk and therefore changing the perception that dairy cannot be a revenue earner.

The bulk of the milk production is concentrated in the northern region, with some states such as Uttar Pradesh in the producing more milk than countries such as Australia and Argentina. The east, by contrast is a milk deficit zone. The milk surplus states in the country

are Gujarat, Maharashtra, Rajasthan, Uttar Pradesh, Punjab, Haryana, Karnataka, Tamil Nadu and Andhra Pradesh.

Over 50% of milk produced in India is buffalo milk. This is given preference over cow' milk in several regions because it has a higher fat content.

The Indian farming system is largely unorganized. The average farmer practices dairy farming to provide supplemental income and has a herd of one or two animals. Milk yields vary between 400kg/year to 3000 kg/year, while the average yield is about 800 kg/year. Typical yield of ethnic breeds: vary between 0.5 kg and 2 kg per day due to inadequate, poor quality feed.

- Cross breed yields: up to 10 kg per day. Most dairies have to depend on large catchment areas to source sufficient milk quality. Some dairies use collection agents who are paid a commission of approximately Re 1 per kg to collect milk and bring it to the processing location. Some modern dairies now have collection points linked to chilling centers at numerous in their catchment area. However, few dairies have the resources to invest large amounts in setting up this infrastructure. Setting up a network of bulk coolers can increase the investment required in establishment a dairy plant by over 5%.

The average time elapsed between milk collection and milk conversion is very high in India as compared to international norms. This leads to higher bacteria count in Indian milk and creates quality

issues. New players into Indian dairy industry must be cognizant of the additional investment that would be required to ensure high quality standards in dairy products produced here. Establishment a milk procurement infrastructure poses the single biggest challenge to the dairy industry and forms the greatest barrier to entry.

VALUE CHAIN: -

The organized sector accounts for less than 15% of the milk produced in the country. Of this, the cooperative sector handles 60% and private dairies account for the remaining 40%. The rest of the milk is either consumed at farm level or sold as fresh non-pasteurized milk through the unorganized channels of local milkman. The share of organized sector has been rising steadily for example; the share of cooperative has risen from 1.8% in the 1970s to its current level of 7.5%. This share is likely to grow further at the cost of the share handled by local milkmen. This is due to various demographic factors.

REGULATORY ENVIRONMENT: -

In general, the dairy industry faces little government intervention. The key regulation concerns the setting up of Greenfield capacity, for which government permission is required. The Milk and Milk products Order (MMPO) regulate the production

of milk and milk products in India. The objective of MMPO is to prevent unhealthy competition among dairy plants for the limited quantity of raw milk available in milk sheds. MMPO prescribes state government registration for plants producing 10,000 to 75,000 liters of milk per day or manufacturing milk products containing 500 to 3,750 MT of milk solids per year. Plant producing over 75,000 liters per day or more than 3,750 MT per annum of milk solids have to be registered with the central government. The order requires no permission for units handling less than 10,000 liters of liquid milk per day or milk solids up to 500 MT per annum.

A proposal to raise the exemption limit for the compulsory registration of dairy plants from 10,000 liters a day to 20,000 liters is being considered by the Animal Husbandry Department. The 75,000-liter limits are likely to be raised either to 100,000 liters or 125,000 liters in the amended order. Foreign equity participation up to 51% is automatically permitted. Indian producer receive no subsidies, for domestic sales or exports.

For balance of payments reasons, India maintained import restrictions until 1999 on a number of dairy and other agriculture products, consumer and textile goods. However these were removed as India's balance of payment improved.

While restrictions on SMP and butter oil were wholly removed in 1995, restrictions on other products were removed in two stages as stipulated by WTO requirements from April 2001 as shown below:

-April 2000- Liquid milk and cream of fat content exceeding 6%; milk powder with fat greater than 1.5%; condensed milk without sugar; sweetened condensed milk; sweetened skimmed condensed milk.

-April 2001- Milk powder for babies, milk powder without sugar, butter, dairy spreads, butter oil, fresh/ processed cheese. All dairy imports require a sanitation permit issued by the Department of Animal Husbandry.

India's commitment to the WTO on dairy products relates to binding of tariffs. There were no other commitments on tariff quotas, minimum access levels, domestic support or export subsidies. The basic import duty on the dairy products listed below ranges from 35% to 60% and can be raised to 120% bound rate duty, if necessary. Trade in dairy products is largely limited to export of casein and milk powder, and import of butter oil and milk powders. Imports are chiefly driven by the price differential between the domestic and international markets rather than by domestic shortages.

CO-OPERATIVE DAIRY IN INDIA:-

In India, milk is processed and marketed by 170 Milk Producers' Cooperative Unions that are grouped to form 15 state Cooperative Milk Marketing Federations.

GCMMF, for example, represents Gujarat state's federation of milk processing co-operatives, while APDDCF represents it for Andhra Pradesh.

The major dairy cooperatives are identifiable by the strong brands they have created-these include Amul (Gujarat), Vijaya (Andhra Pradesh), Verka (Punjab), Saras (Rajasthan), Nandini (Karnatak), Milma (Kerala) and Parag (Uttar Pradesh).

State cooperatives have had varying degrees of success in organizing milk production. In Gujarat, cooperatives procure 31.4% of the total milk production, against a national average of 7.5%. The other success stories include Karnataka, Tamil Nadu, Andhra Pradesh and Maharashtra.

The National Dairy Development Board (NDDB) supports the operations of the dairy cooperatives. NDDB supported their development by providing them with financial assistance and technical expertise.

NDDB also undertakes dairy projects under its own umbrella for the development of the sector. One such projects, called Mother Dairy, marketed milk in key Indian cities. Mother Dairy operations in Delhi were recently incorporated to form a 100% NDDB owned company called Mother Dairy Fruits and Vegetables Pvt. Ltd.

DAIRY COMPANIES IN INDIA

PROCESSING AND DISTRIBUTION: -

Milk is processed into a variety of products in India. Processing takes place substantially in the unorganized sector and in the home.

In the absence of product with long shelf life most dairy products are distributed locally. National dairy brands such as Amul, Nestle and Britannia use multiple dairy plants, which they either own or out sources at various location to source dairy products. The marketing of national brands focuses on products with long shelf lives. These are tropically western products such as cheese, ice cream and butter. Recently, companies have lunched lassi and curd on a national scale on the back of significant advancements in the shelf-life of these products.

DAIRY COMPANIES: -

Both cooperatives and private dairy companies are active in the Indian dairy market. Most companies have a regional presence and a products portfolio limited to liquid milk, ghee and butter.

OVER CAPACITY PROBLEMS: -

Dairy-processing companies are marked by significant over-capacity, especially those in the private sector. Total processing capacity is estimated at 59 million liters per day as compared to the processing average of 33million liters per day. The key reasons for this are:

-Inability to establish a procurement set-up to source sufficient milk. Several private dairies have set up processing capacity but lack a clear understanding of the challenges posed by milk procurement. Procurement by private dairies is difficult for two reasons. The fact that the average farmer has just one or two animals means that the dairy needs to tap a very large area to procure sufficient quantity.

The investment required for setting up appropriate procurement infrastructure becomes prohibitively expensive. The procurement problems of private dairies are compounded in regions where the dairy cooperatives have a stronghold and farmers are not willing to sell milk to private dairies.

INADEQUATE MARKETING INFRASTRUCTURE: -

Most dairies have focused on commodity products such as liquid milk and butter oil, which are marked by low margins and huge competition from unorganized players. These dairies have not focused on establishing a marketing platform and their utilization of capacity has therefore, been constrained by their inability to sell.

Indian dairy products, like buttermilk, lassi and curd, have strong demand growth and face limited competition. However, producers have been unable to launch these products successfully because investment in research to increase their shelf life have been lacking.

FUTURE STRATEGIES

PROCUREMENT AND PROCESSING COMPANIES: -

Such companies will specialize in manufacturing dairy products, primarily on contract for other large players. Many of the Indian dairy companies are likely to be forced to adopt this position, as they find their marketing resources to be inadequate in comparison with other large marketing players, including the dairy MNCs. It is likely that these companies would continue to market some products, such as liquid milk, butter and ghee, in their region on a limited scale. These companies would also focus on the production of milk powder, industrial product such as casein and whey protein concentrated (WPC) for export or sale in wholesale markets in India.

The long-term sustainability of these companies would be determined by the contracts that they enter into with other marketing companies. The other factors that would affect their sustainability are:

- *the procurement infrastructure they establish
- *the quality of milk and milk products produced
- *their ability to provide a range of dairy products to meet all the customer requirements
- *the ability to

supplement their income from contract manufacturing by marketing some products locally under their own brand name.

One company following this positioning strategy is Dynamix Dairy. The company has long-term supply arrangement with several large companies, such as Nestle, Britannia and Mc Donalds. The company supplements this activity with exports of casein, the local sales of products ghee carrying its own brand. Success of such companies would depend on levels of capacity utilization achieved.

MARKETING COMPANIES: -

These are primarily the multinational companies, whose focus has been on marketing dairy products. Either locally sourced or imported from their other manufacturing bases around the world. These companies are likely to adopt pan-Indian presences, for which owning processing capacity at various location across the country is not feasible. In order to be successful in this position, the company must have:

- *a large products portfolio to justify the huge distribution and marketing costs
- *a products portfolio that may differ across different regions, based on preferences and cultures.
- *Suitable contract manufacturing arrangements with various dairy companies across the country, such that freight cost is minimized.

One example of a company following this positioning strategy is Britannia. The company does not have any manufacturing facility; rather it has long-term sourcing arrangement with Modern Dairy in the, and Dynamix

Dairy in the west. Its products portfolio includes butter, cheese and flavored milk. Even though its dairy sales are not too substantial, the company's risks are limited by the fact that its fixed costs of distribution are spread across Britannia's other products, which are primarily bakery items.

PROCESSING- CUM-MARKETING COMPANIES: -

These are the large food players with a very strong focus on dairy. They have either evolved from processing player with strong brands that acted as marketing platforms or from smaller marketing companies that established or acquired dairy- processing operations because the dairy sector assumed great importance in their portfolio. For example, cooperatives such as GCMMF and APDDCF commenced operations with a focus on procurement and milk processing.

In the process they managed to establish very strong brands. In order to leverage the brand equity, they are now exploring a strategy whereby they will sell their own products in their home region while entering into contract manufacturing arrangements with other dairy companies to procure and market dairy products under their brand name in other parts of the country such as Nestle which is primarily known for its marketing skills, preferred to establish its own dairy plant in India. Nevertheless, Nestle also uses a mix of sourcing from own dairy and other dairies to cater to the requirements of different regions across the country.

POSITIONING NEW PLAYERS

New entrants to Indian dairy industry should aim to adopt the positioning strategies outlined in this article. The strategy would depend on:

- The product portfolio envisaged.
- The region of operation, e.g. urban or all India or limited to one region
- The aim of entry into India. Would India be a market for products produced elsewhere or a production base?

It would be important to for a new player to enter into a joint venture or alliance with an existing player in order to reduce time to market. Britannia's recent alliance with fonterra has heightened the other Indian dairy company's need to partner with international dairy companies.

While evaluating the potential partners in India, the new player would need consider parameters such as management fit, quality of procurement infrastructure (and therefore additional investment that would be required in upgrading the milk quality), product capabilities, and strength of brand and distribution network.

The larger cooperatives, such as APDDCF, provide a sizeable processing capacity and an established national brand and distribution network for foreign companies envisaging entry into India. On the other hand, smaller private sector players such as

Hatsum Agro, Nilgiris and Vadilal provide a new entrant with processing capacity, good management fit, strong regional brands and a distribution network. Given the extent of overcapacity in the dairy processing sector, the acquisition route in establishing a manufacturing base is not expected to be difficult.

ROLE OF WOMEN IN DAIRY ENTERPRISE: -

In crop husbandry the specialized operations like selection and storage of seeds, seed treatment, transplanting, sowing, weeding, fertilizer application, harvesting, winnowing, threshing are carried out by women. In the small and marginal farm families, women engaged themselves in many of the farm operations either in their own field or others, as hired laborers. The rate of participation of women has been found to be 58.3% in marginal farms, 52.71% in small farms and 53.90% in medium farms.

It has long been recognized that women have an important role in livestock production, care and management and in the processing and sale of livestock production. In this sector, women's work includes collection of fodder and water, cooking grains for cattle, preparation of concentrate feed for animals, feeding the animals, cleaning and washing cattle shed, cleaning and bathing animals, milking, preparation of milk products, taking the animals for roadside grazing, management and marketing of milk, collection of cow-dung, preparation of cow-dung cakes and their storage, and

preparing manure for the farm. Though more than 95% of the work related to animal care is performed by feminine gender, they do not own cows.

World economic profile of women shows that they represent 50% of the population, make up 30% of the official labour force, perform 66% of all working hours, receive 10% of world income and own even less than 1% of the world's property. Everywhere women as a group enjoy fewer advantages and work and opinions are undervalued. In many countries women earn less than men, and are prevented from owning land, face numerous obstacles to holding position of authority and face many threats of violence just because they are women.

It has been rightly observed that half of the women's work is unpaid and the other half is underpaid. There is no country where considerable differences are not found between the earnings of men and women and they have no control over their earnings.

In India although 87% of women are in agricultural industry only 36% of women have their own land the remaining work as agricultural laborers. In spite of women's preponderance in agricultural, it is estimated that only 5% of rural credit from multilateral banks ever reach women. Women's eligibility to receive technology and credit is questioned on the ground that they are not asset holders and do not have the status of a producer. Further more the existing loaning procedures are very cumbersome and prohibitive for women. In a nutshell women have access neither to agricultural

information and services nor to production assets. Thus they suffer due to the limited access to the production resources.

Seasonal variation in agricultural timetable brings additional constraint and special problems for rural women. Women bear the brunt of hardship arising out of seasonal unemployment or under-employment.

Women's activity in production and marketing is strongly influenced by the stage of the family life cycle. The presence of small children inhibits women's labour availability and mobility unless they are part of extended or multi-generation household. The lack of flexibility in terms of working hours, place and duration of work puts definite constraints on women of reproductive age. The lack of maternity care facilities also has negative impact on their productivity.

“BUNDELKHAND REGION”

The Bundelkhand lies between 24°27' N latitude and 78°10' to 80°34'E longitude. The river Yamuna, while the south and the west by Madhya Pradesh, demarcates the northern boundary of the region. The eastern boundary is determined by Allahabad district of Uttar Pradesh. The region has two commissioners with head quarters at Jhansi and Banda comprising the seven districts, i.e. Jhansi, Lalitpur, Jalaun, Banda, Hamirpur, Mahoba and Chitrakoot (Karwi district). This is one of under developed region of the country,

owning to complexity of climate, edapic and socioeconomic limitation on one hand and significant past history and social customs on other hand.

The Bundelkhand has total geographical area of 29418Sq. Km. (which is the 10% of the area of u.p.) and population 67.30 million with a density of 228 people per Km² (1991 census). The total tonsils are 23, while the block and villages are 47 and 5234 respectively in Bundelkhund. The total number of towns is 51 among which only one, Jhansi class one town. The sex ratio is 847 females per one thousand males. The total literacy percentage stands 34.3percent, while the female literacy in 19.34 percent and the male is 46.98 percent in the region. The share of geographical area in the different districts has recorded highest in Banda district (7624Sq. Km), followed by Hamirpur and Mahoba (5024 Sq. Km.), Jhansi (5024Sq.Km) and Jalaon (4565Sq.Km.). The land use of Bundelkhund is also noticeable factor, where the net sown area is about 61% of total land, while main other uses are under forest 8.6% garden and groves 6% fallow land 8.17% and parati

CLIMATE: -

The location of the region creates a particular type of climate. This central position between monsoon type maritime climate of the east coast (the bay of Bengal) and tropical condimental dry climate of west (Indian desert) imposes the features of transition climate. The

climate of region is characterized by excessive heat during the summer months and mild cold during winter. Thus Bundelkhund falls under semi-arid climate with aridity index of 38 *Lang's* rain factor 34.9 and N.S. quotient 78.8 in Jhansi.

TEMPERATURE: -

The mean monthly maximum temperature ranges from 24.6°C in January to 42°-5° in May. The mean monthly minimum temperature varies between 99°C in January to 29.2°C in June. The normal mean monthly maximum temperature has been record as 45.7°C while. The peak maximum temperature was 47.8°C. The lowest minimum temperature has been recorded up to 5.8°C.

RAINFALL: -

Amount of annual precipitation in Bundelkhand varies between 90Cm to 100Cm. The study made for the last 50 years reveals. The fact that is uncertain, unreliable and variable. Ninety percent of the annual rainfall is received in 46 days during the rain season. The region gets maximum rainfall during. The months of July and August which provides 35 and 33 percent of the annual rainfall respectively. Area in northwest receives nearly 90Cm while the southeast 120Cm mean annual rainfall.

VARIABILITY OF RAINFALL: -

Analysis of 27 years (1941-1967) weekly_rainfall data as regards percentage probability and coefficient of variation reveals wide fluctuation and considerable uncertainties. In the month of July the precipitation is recorded very high while the stage become moderate in the last two week of August. This position remains up to middle of September. In the last week of September it decreases up to 40 percent. Again some probability remains in January this variability leads to uncertainties in agricultural operations.

CLIMATIC CHANGES: -

The magnitude of decrease in mean monthly minimum temperature is conspicuous (3.5°C to 4.6°C) during the period from December to April. In the case of mean maximum temperature, the variation is not more than 1°C . The mean annual precipitation of the last twelve years is 27.5 mm more than that of the easily twenties.

WINDS: -

The average speed of wind is found to be the lowest (4.02Km per hour) during the winter season. In summer the speed becomes double to it (8.15 Km per hour) while in rainy season it is recorded to be decreased (6.5 Km per hour).

SEASONS: -

The seasons gradually convert into cool from mid October to February. December and January are the coldest months of the period. Sometimes, a little winter shower, locally known as Mahawat, occurs but it is not more than five percent of the annual rainfall. It is very useful for Rabi crops. The weather begins to be warmer just after March and temperature starts unceasing with the sun rising and warm speedy winds blow called 'Loo'. Temperature starts falling from the third week of June and heavy rain starts from July. Maximum amount of total annual rainfall.

AGRO CLIMATE: -

FEATURES OF THE BUNDELKHAND REGION: -

The climate of region represents a transition zone of tropical sub humid to semiarid and falls under hot moist semiarid and ecological sub region. It is characterized by dry summers and cool winters with mean annual temperatures between 24-25°C. The mean summer (April-May-June) temperature is 34°C that may rise to a maximum of 40-42°C during the months of May and June. The mean winter temperature (December-January-February) is 16°C, which may drop to 6-7°C in December and January.

The mean annual rainfall ranges between 800-1000mm covering 55-63% of mean annual PET (potential evapotranspiration, 1400-1600mm). The intensity of rainfall increase towards east. About 90% of the annual precipitation is received during monsoon season setting in the last week of June and /or first week of the July and extending to 1st week of October in most of the years. There occurs brief precipitation of less than 30% probability in the first fortnight of January as winter rainfall.

The water balance studies show SMCS (soil moisture control section) gets dry from November onwards with intermittent moist spell during January in most of the years. The moisture index (IM) ranging between 30-40 in the area qualifies for moist semiarid condition. The moisture availability period ranges from 120-150 days, which begins from first fortnight of July and ends by the first fortnight of November with water surplus of 100-300 mm during July to September.

The SMCS remains partly or completely dry from February till middle of June accounting for more than 90 cumulative days in a year and as such the soil moisture regime qualifies to be ustic. The MAST (mean annual soil temperature) is $>22^{\circ}\text{C}$ and the difference between MSST (mean summer soil temperature) and MWST (Mean winter soil temperature) is greater than 5°C qualifying for the hyperthermic soil temperature regime (Mandel et. al 1995).

AGRICULTURE AND CROPPING PATTERN: -

The region comprises one of the backward regions and traditional agriculture is practiced in major parts although population mostly depends on agriculture for survival. Out of the total geographical area of 2.9mha. Net sown area is about 2 mha. While grass cropped area is 2.38 mha. Out of the total area, grass irrigated area has been reported as 0.82mha (34.5%).

The dominant crops are wheat, gram and jowar. The other crops are Arhar, lentil and inseed. Rice also occupies significant area in Band and Jalaun districts.

As rainfed agriculture is predominant, major area is under single cropping. In kharif season, jowar is the dominant crop while lentil, gram and linseed are grown with residual moisture in Rabi. Under irrigated conditions; wheat is mostly grown with Rabi pulses and oilseeds as pure or mixed crops. Cultivation of Arhar on the bounds of paddy fields is a general practice. Major vegetables are potato, onion, ginger and tomato. Mango, guava, ber and citrus are cultivated as fruit crops. Major cash crops of the region are sugarcane, betel leaf, and tobacco and sun hemp

THE AREA UNDER DIFFERENT PRINCIPLE CROPS IN JHANSI DISTRICT DURING 1993-94: -

Once irrigation available it in cropping patterns, cropping system and cropping intensity by including more remunerative high value crops and the integrated intensive holistic farming system. To increase efficiency of irrigation, more efficient methods like sprinkler and drip must be used.

Table-1: 4 the area under different principal crops in Jhansi district (1993-1994)

S.No.	Particulars	Area	Percentage
1	Wheat	113484	31.50
2	Groundnut	21417	05.90
3	Total pulses	170383	47.37
4	Maize	2565	00.80
5	Paddy	2143	00.60
6	Sugarcane	120	00.03
7	Other prime pulses	49940	13.80
8	Total area shown	360552	100.00

CEREALS AREA, PRODUCTIVITY AND GROWTH RATE:

Among cereal crops paddy and wheat are relatively more important crops than the Jawar and Barley. In Jhansi district paddy is replacing Jawar in Kharif in kabar and to some extent in Mar soils.

Crop paddy is a new innovation for Jhansi district; it has covered kharif fallow land significantly. The area and productivity of Paddy crops has increased by 84.62 percent and 21.74 percent respectively. The area and productivity of Jowar is decreasing by 50.36 percent and 2.82 percent respectively. The productivity of wheat is increasing by 38.67 percent, which indicates the high use of critical inputs and price support announced by Govt. of India. It is also evident from the table -1: 4 that wheat has substituted area of Gram and Lentil. Table-1: 4 indicate area under different principal crops in Jhansi district.

Among oilseeds the area and productivity of Soybean crops and mustard is increasing with as high rate 502.91% and 139.49% respectively. Mustard has occupied the second place. The increase in area and productivity of mustard is as much as 219.81% and 45.38% respectively. The other oilseeds like Til, Groundnut and linseed are also increasing.

It is the evident from the table-1: 4 that potato, tomato, onion and brinjal are important vegetables. Ginger, garlic and turmeric spices are grown in baruasagar area of Jhansi, which is famous for ginger and calocacia.

It is evident from the result that a very small area of 6.9% is being used for double cropping. Major cultivated area of 47.3% is utilized for pulse production. Out of total cultivated area 27.5% and 72.0% area is covered under Kharif and Rabi crops respectively. Zaid

crops are grown only in 0.37% of cultivated area where assured irrigation is available.

CROPPING PATTERN: -

Introduction of canal irrigation and price support system by government of India through bring dramatic change in cropping pattern in other zones in the state of U.P. during last two decades but failed to do so in Bundelkhand zone, because rained agriculture still dominates in this zone having only 26.9% irrigated area. Cropping intensity of only 111.2% indicates the facts that major area of the zone still remains under single cropping.

Table –1: 5 Existing cropping pattern in Jhansi

Dis- trict	Crop- ping Intensity	Net area sown (Lakhs ha)	Cropping (% area sown)			Area sown more Then once (%)
			Kharif	Rabi	Zaid	
Jhansi	111.2	3.33	27.5	72.3	0.37	6.9

NATURAL RESOURCES OF BUNDELKHAND REGION

(1) SOIL: -

The soils of Bundelkhand fall into two main groups viz. red and black soil. The red soil, which is derived from disintegration of pink granite, exists specially in districts of Jhansi and Lalitpur. The grain size of the soil varies from medium to coarse. Crops suffer more in these soils due to its poor water holding capacity. The black soils are clayey and usually occur in low laying area of dist Jalaun, Hamirpur, and Banda. The grain size of the soil varies from fine to medium having high water retaining capacity. These two main soil groups generate four soil series, locally known as Raka, Parwa, Kabar and Mar. The broad distinguishing feature of each of these soil series are given below: -

RAKAR: -

Raker soils are coarse and gravelly textured, reddish to brownish red in colour. The depth varies from few inches to about two feet with parent rock lying at the bellow. The soils hardly retain moisture for the use of crops. Thus, this soil is fit for growing crops like sorghum, urd, moong, sesame, groundnut etc.

PARWA: -

Parwa soils are loam to sandy loam in texture. The colour varies from gray to brownish gray and deeper to reddish gray. These soils are of medium depth (40-75cm.) and the parent rock is found at the bottom of soil at greater depth than Raker soils. The soils are although poor in organic matter, is fairly productive. Good management practices including proper irrigation, adequate manuring with bulky organic matter and optimum doses of fertilizer all crops can be grown in these soils.

KABAR: -

Kabar soils are clayey, coarse grained in texture and black in colour. These soils are considerably depend the parent rock lies at greater depth. Wetting these soils retain sufficient moisture, where on drying cracks occur and usually associated with poor drainage crop like paddy can be grown successfully during Kharif

MAR: -

Mar soils are black in colour, fine texture and of considerable depth. These soils are prone to a very marked extent of swelling and contracting during wet and dry periods. On drying large cracks and very wide fissures develop. During wet periods, these soils develop

very poor physical condition due to their peculiar characteristics and behavior towards moisture. Being good moisture retentive soil, Rabi crops like wheat and gram can be grown even without any irrigation.

Among four major soil types, parwa predominates in Bundelkhand zone that accounts for 38.50 percent of the total cultivated area followed by kabar (31.45%) Rakar (17.63%) and Mar (12.42%). Besides Parwa, Rakar, soil predominates in Lalitpur and Banda districts where as Kabar in Hamirpur, Banda and Jalaon. Almost all soil types suffer from splash erosion to deep gullies.

(2) WATER RESOURCE: -

Bundelkhand region receives an average annual rainfall of 1000mm. The annual rainfall ranges from 800mm in the north-west to 1300 mm in south-east about 90 percent of the total rainfall is received during the period July to September.

Thus the total quantity of annual rainwater received in the region is about 7lakh ha.m. Besides, many perennial rivers run through the zone. The major river Yamuna, flowing from west to east from the northern boundary of the region, while its many important tributaries, viz. Sindh, Betwa and Ken along with their tributaries drain the entire Bundelkhand region in to river Yamuna. The important tributaries are; Saprar, Shanjad, Sajnam, Jamin, Pahuj, Dhasan and Sonar. The letters ones are in flow mainly during the rainy season. No estimation of quantity of water is made and only a

fraction of water from Betwa, Saprar, Pahuj, Baghain, Shahjad, Jamini, Ken, Ohan, Barwa, Dhasa, Arjun, mageria, Chadrawal, Kealari, Gunsh and Yamuna (through lift pumps) is being utilized presented for irrigation.

(3) FOREST AND ORCHARD: -

Under forest Bundelkhand zone constitute only 8.1% area. The per capital forest area of the zone found to be 0.044 ha which reduced to 0.036ha in the period of about ten years. The zone has 36000 ha area under fruits. The maximum area under fruits trees in Banda followed by Jhansi and leas in Hamirpur.

More dense forest is found on the banks of the rivers like Betwa, Ken, Sindh, Nevada, Jammer, and Dhasan, which help in the folowishing of local business in the area. These forests are famous for its wood like timber, tendu, mango, macca, neam, pepal, bargad, palash and babul. The wood of semar and mang tree is used for matchsticks, tendu for bide making, khair for preparing kattha, and gum is also prepared from babul tree. Various types of furniture prepared from these wood. Jhansi, Katni, Satna have become the hub of bidi industry. Mana is actually the fruit of Bundelkhand and is used in edible oils, alcohols, medicines, etc. chirongi is found in alrerdance in the forests of Bijawar.

The forests of Bundelkhand contain many wild animals like lion, leopard, wild boor, elephant, neelgari, deer, cheetal, bear, fox,

jackal, rabbits etc. and birds like parrot, koyal, neelkanth, crow, eagle, cultures, etc.

LAND RESOURCE: -

Land is a scarce resource on which the very existence of man depends. Land cover in Bundelkhand region is a complex and dynamic owing to combination of factors viz. topography, geology, hydrology, soils, micro climates and community of plants and animals that are continuously interacting under the influence of climate and people's activities. Since the availability of this basic resource is limited hence there is an urgent need to strike a balance between the competing elements on the land resources between various activities and with regard to its sustainability and capability. The continuous misuse and exploitation of land and allied resources have resulted in its degradation and destruction. As a result of poor planning and in many cases because of unscientific and ruthless exploitation of natural resources, we have degraded our physical environment. By environment i.e. the whole complex of climatic, soil, water and biotic factors on which we all subsist and on which our entire agricultural and industrial development depends. Rapid economic development is turning India into a vast wasteland. If poverty in pre-independence India was the result of under utilization of resources, there is every possibility that poverty, unemployment and in quality of modern India would continue to persist due to the destruction of environment.

LAND UTILIZATION: -

The utilization of land in Bundelkhand region has total wasteland of about 613880 hectares, which is 20.73% of total geographical area (2960910 hectors). These wastelands can be improved by sustainable land use pattern.

**Table-1: 6 Source of irrigation in Bundelkhand region
(2001-2002)**

Districts	Net- irrigated area	Cannel	Government cesspool	Personal cesspool	Other sources
Jaloun	159365 (100.00)	117287 (73.60)	9762 (6.12)	20078 (12.60)	12238 (7.68)
Jhansi	196926 (100.00)	90073 (45.74)	2080 (1.06)	3637 (1.85)	101136 (51.35)
Lalitpur	187789 (100.00)	55910 (29.77)	- -	12535 (6.67)	119344 (63.55)
Hamirpu	101447 (100.00)	34494 (34.00)	13240 (13.05)	24880 (24.52)	28833 (28.43)
Mohoba	101300 (100.00)	34935 (34.49)	- -	1110 (1.10)	65255 (64.41)
Banda	112477 (100.00)	62434 (55.50)	10289 (9.15)	19655 (17.47)	15099 (17.88)

Chitrkoot	45931 (100.00)	16802 (36.58)	239 (0.52)	12160 (26.47)	16730 (36.43)
Total	905235 (100.00)	411935 (46.06)	35610 (3.93)	94055 (10.39)	358635 (39.62)

Figure in parenthesis indicate percentage of Net irrigated area.

SOURCE OF IRRIGATION :-

Table-1: 6 show that in 2001-02, mostly 411935 hectares were irrigated by cannel. Cannel accounts for 46.06 percent of total irrigated area and gradually, by other sources, personal cesspool, government cesspool about 39.62%, 10.39% and 3.93% Of total net irrigated area in Bundelkhand Region.

LIVESTOCK IN BUNDELKHAND REGION

The Bundelkhand region comprising of parts of Uttar Praddesh (Banda, Jalaun, Hamirpur, Jhansi, Lalitpur, Mahoba and Chitrkoot district) and M.P.(Datia,Tikamgarh,Chhatarpur,Panna) India has a semiarid environment and is predominantly an agricultural economy. Bundelkhand has 9.2 million livestock (cattle, Buffalo, Goat, and sheep are 5.4, 1.6, 1.8 and 0.4 million, respectively) population, which is one of the densest in terms of livestock per unit of cultivated land. Average size of the land holding in Bundelkhand is 1.28 ha. Of which most of them are marginal farmer who dependent wholly or partially on livestock farming of the available land less then 1% is

used for the cultivation of fodder crops and majority of the fodder fed to the livestock being sourced from the crop residues. About 19.87-lakh ha. of land is available for grazing of the 30.16-lakh adult cattle units (ACU) in Bundelkhand region. Average production of forage from this grazing area is less than 21/ha/year, which is not even sufficient for one adult cattle unit (ACU) as the normal requirement is 2.55/year. Livestock production in this region heavily depends on traditional feeding methods including most common “**Anna Pratha**”. Further, sustained and high production growth rates, combined with limited and rapidly diminishing land holds and land for food grains and cash crops led to shortage of feed and fodder to livestock in this region, which resulted in over grazing of the available land and practice of “**Anna Pratha**”. The over grazing pressure (ACU/ ha) was 4.74 in UP part of Bundelkhand. While it was 2.84 in the MP. part. To overcome this problem, efforts are necessary to increase forage production through establishment of proven silvipastoral systems on waste and community land. It produces 4.61 of forage (ha/year) and further practice of rotational grazing will allow belittling damage due to grazing and fulfilling the feeding requirements of livestock.

Table –1: 7 Livestock in Jhansi division[Year-2002-03]

	Jhansi	Lalitpur	Jaloun	Total
Total Cows	355294	409923	287073	1052290
Male	127786	145222	86588	359596
Female	129912	136778	98742	365432
Calf & She calf	107496	127923	101743	337162
Total Buffaloes	142118	114091	195775	451984
Male	1247	2470	5458	9175
Female	83827	61328	105518	250673
Calf & Filly	57044	50293	84799	192136
Sheep	69500	23076	47258	139834
Goats	205165	13128	214180	432473
Others	53895	27754	49181	130830
Total	825972	587972	793467	2207411

JUSTIFICATION: -

In Bundelkhand region, Majority of farmers is small and marginal engaged in dairy enterprise for their livelihood. They maintain milch animal due to small size of holding and ample amount of family labour. Therefore Dairy

business play an important role in providing employment opportunities in rural area and particularly to the weaker section of the community for the economic development of rural area in long run, it is necessary to encourage agriculture pursuits as the availability of land is getting diminished day by day low cost food and feeding, breeding, management and marketing make the dairy business viable in rural area.

The employment was oriented; women contributed more than 70% of the labour requirement in livestock production.

OBJECTS: -

The study has been conducted keep in mind specially fallowing objectives: -

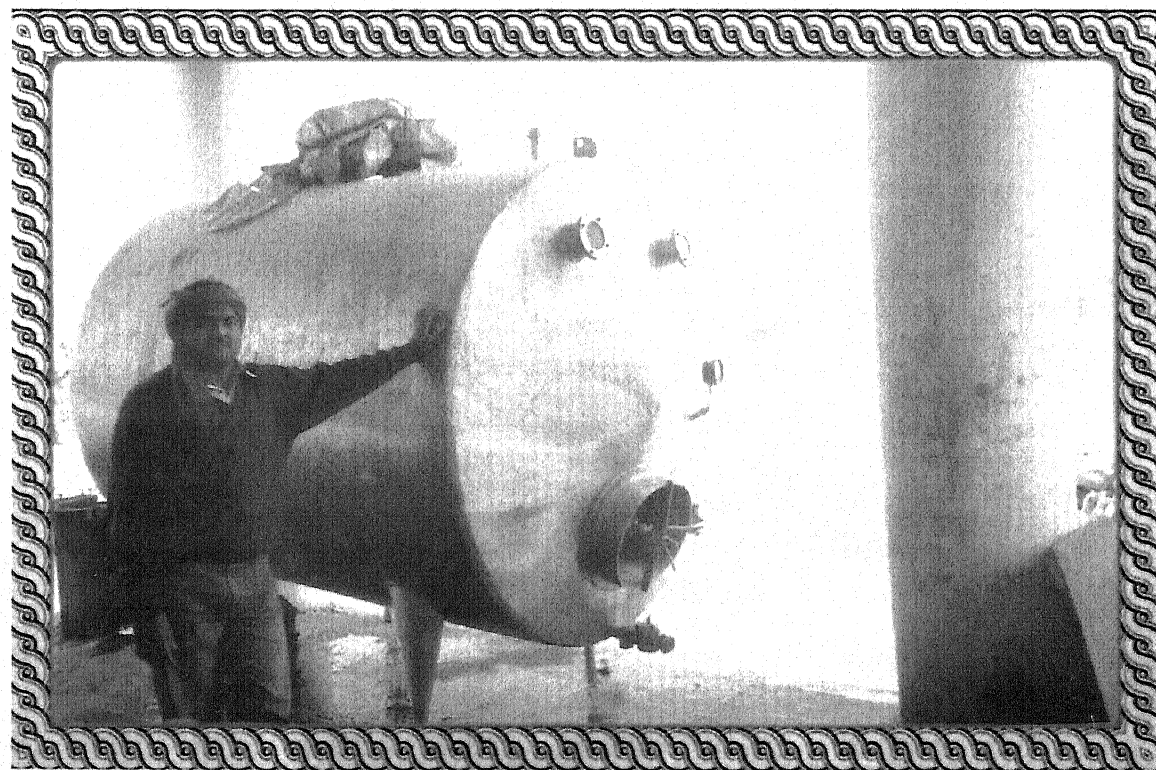
- i. To study of nature and extent of co-operative dairy enterprise in village of Bundelkhand region of Uttar Pradesh.
- ii. To analysis cost and return per unit [per litter] of milk in Bundelkhand region.

- iii. To examine comparative socio-economic aspects co-operative and non-cooperative dairy enterprising women in Bundelkhand Region of Uttar Pradesh.
- iv. To examine marketable surplus and different channels used in marketing of milk and its production Jhansi district.
- v. To suggest remedies and measures for stream ling the adoption of dairy innovation in order to uplift the economy of dairy.

HYPOTHESIS: -

1. The main source of Income livestock and dairy enterprise after agriculture crops in different source of income in Bundelkhand Region.
2. Per unit Expenditure decrease to milk production along with size increase of farm unit.

3. Participation of women more than man in dairy enterprise.
4. The share increases in consumer value to productive along with decrease to arbitrator in different channel of milk marketing.
5. Milk and milk product, production and consumption increase along with farm area increase.



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CHAPTER-2

Research Methodology

Concepts and Terms Used in the Study

Review of literature

CHAPTER-2

RESEARCH METHODOLOGY&REVIEW **OF LITERATURE**

“Research comprises defining problems, formulating hypothesis or suggested solutions, collecting, organizing and evaluating data, making deductions and reaching conclusions to determine whether they fit the formulated hypothesis.”

(Clifford Woody)

The present chapter deals with the methodological frame work used in the present study.

1. SAMPLING DESIGN: -

A multi-stage stratified random sampling design has been adapted to select districts, block, villages and dairy household.

(a) Selection of District: -

The study was conducted in Jhansi district of Bundelkhand region. Jhansi district was selected randomly it represent Bundelkhand region. The cropping intensity of the Jhansi district was 120% in the year 2000-01.

(B) SELECTION OF BLOCK: -

First of all, a list of block of Jhansi district was taken from C.D.O. office, Jhansi. There were 8 blocks in Jhansi viz. Baragaon, Bavina, Month, Chirgaun, Bamaur, Gursaray, Bangra and Mauranipur. Out of these 8 blocks, two block were selected randomly viz Mauranipur and Gursaray.

(C) SELECTION OF VILLAGES: -

First of all, the list of village falling in Mauranipur. block taken from B.D.O.offices. The total number of villages in the block was 83. Simultaneously from block Gursaray also taken a list of villages was taken there were 103 villages falling in the block. All the villages were arranged in alphabetical order. Then a sample of 4 villages, two from block was taken. Hence two villages namely Bhitora and Tejpura were selected randomly from Mauranipur block. Similarly from block Gursaray two villages namely KedarTai and Bagroni Jageer were selected randomly for the present study. "Thus 4 villages selected for the study".

(D) SELECTION OF SAMPLE HOUSEHOLD: -

A list of all the growers of milk with their owned holdings was prepared for the selected villages. The total number of growers

in the four selected villages was about 600. Then the households were categorized into four-farm size group viz. marginal (0-1 hectares), small (1-2 hectares), medium (2-4 hectares) and large (Above 4 hectares). The number of farmers falling in marginal, small, medium and large farm size groups came to 300, 150, 100 and 50 respectively. After doing so, a sample of 120 cases was taken randomly. The final selection was made from the different strata based on production to its size. Thus 60 cases in marginal, 30 in small, 20 in medium and 10 in large farm size group were selected for the present study randomly as show by the table No. 2:1.

Table No. 2:1 case selected for the present study

S.No.	Size group	Total No. of cases	Cases selected
1.	Marginal (0-1 hect.)	300	60
2.	Small (1-2 hect.)	150	30
3.	Medium (2-4 hect.)	100	20
4.	Large (< 4 hect.)	50	10
5.	Total	600	120

(E) SELECTION OF MILK MARKETING AGENCIES: -

1. Milkman → Consumer.
2. Milkman → Halwai → Consumer.
3. Milkman → Vender → Consumer.
4. Milkman → Milk Co-operative Society → Consumer.
5. Milkman → Vender → Milk Co-operative Society → Consumer.
6. Milkman → Milk Co-operative Society → Co-operative plant → Consumer.

2. COLLECTION OF DATA: -

The present study was based on primary as well as secondary data. The primary data were collected through well prepared Schedules and Questionnaires. A pilot survey was conducted to test the schedule and questionnaire. The whole primary data were collected within three or four meetings with the respondents. The secondary data were recorded from the record of different marketing agencies. The primary data relate to year 2002-2003.

3. SOURCE OF DATA: -

The data to be used have been two types viz.

I. PRIMARY DATA: -

“The primary data is one which is collected by the investigator himself for the first time.”

The primary data were gathered through preproposed Schedules and Questionnaire by personal interview

II. SECONDARY DATA: -

“Data which are obtained from published or unpublished sources are known as secondary data.”

a) PUBLISHED SOURCES: -

There are certain international, national and local agencies, which publish statistical data on a regular basis.

- Statistical Year Book,
- Indian Journal of Agricultural Economics,
- Yojana,
- Kurukshetra
- Committee Reports,
- Private Publication,
- Newspapers and Magazines,
- Individual Research Scholars, etc.

b) UNPUBLISHED SOURCES: -

There are various sources of unpublished data such as the records maintained by the various governments and private offices, B.D.O. office, Agricultural office, Dairy coo-perative office studies made by the Research Scholars in the universities and other research institutions, etc.

4. METHODS OF ANALYSIS: -

(A). ESTIMATION OF COST OF PRODUCTION OF MILK.

(A) EVALUATION OF COST ITEM: FOR COST OF MILK ESTIMATION:

i. FAMILY LABOUR: -

The family labour was charge at the wage rate prevailing the locality for permanent hired labour i.e. Rs. 10/ per labour per day.

ii. MILK PRODUCTION: -

The milk production was evaluated at the rate of the price prevailing during the period in the village i. e. about Rs. 8 per litre of milk.

iii. EXCHANGE LABOUR: -

The exchange labour was treated as family labour was treated as family labour was evaluated at the simple rate at which the family labour was evaluated i.e. Rs. 10 per labour per day.

(B) COST OF PRODUCTION PER LITRE OF MILK:

The total cost, which includes variable cost and fixed cost, was estimated. There are two methods for apportionment of total cost among the main and by product.

i. PROPORTIONATE METHOD: -

Under this method, the total cost of milk was divided in the ratio of the value of main product and by product is estimated separately.

ii. DEDUCTIVE METHOD: -

Under this method, the value of by product is deducted from the total cost of milk production. Then the remaining cost is divided by the amount of main product to calculate the cost of production per litre.

In present study the proportionate method has been used to calculate the cost of production of milk.

5. STATISTICAL TECHNIQUES TO BE USED: -

Tabular analysis has been mode analysis of data. Ratio, percentage, Weighted, average, mean, statistical deviations etc. have also been calculated for the presentation

CONCEPTS AND TERMS USED IN THE STUDY

TERMINOLOGY: -

The various terms related to the present study are defined in the chapter.

1. FARM: -

A farm is defined as unit of land on which the cultivator does the planning with common set of fixed resource. It includes all the area under self-cultivation current fallow.

Or

“A farm is the smallest unit of agriculture which may consist of one or more plots cultivated by one farmer group of farmers in common for raising crop and livestock enterprises. It is both a proroguing unit as well as a consuming unit”.

2. FAMILY FARM: -

“A family holding (farm) may be defined briefly as being equivalent, according to the local conditions and under the existing conditions of technique, either to a plough unit or to a work unit for a family of average size working with such assistance as is customary in agricultural operation”.

3. FARMSTEAD: -

It is a farmhouse with building belonging to it such as cattle shed, machine and implement shed, hen house, well and the like. It is the center for both the home and business.

4. FARM – FIRM: -

The farm is a firm because production is organized for profit maximization. Hence, it is a business unit of control over factors of production. On the other hand, it is a household unit demanding maximum satisfaction of the farm family. The manager of the farm comes to understating with the twin objectives by linking one with the other.

5. FARMING SYSTEM: -

“A unique and reasonable arrangement of farming enterprises that the household manages according to well defined practices in response to the physical, biological and socio – economic environments with the household goals, preferences and resources.”

6. INSTITUTIONAL FARMING: -

The designation and classification of institutional farming depend upon the decision making unit and resource administration.

7. CO-OPERATIVE FARMING: -

Co-operative farming means a system under which all agricultural operations or part of them are carried on jointly by the farmers on a voluntary basis, each farmer retaining right on his own land. The farmer would pool their land, labour and capital. The land would be treated as one unit and cultivated jointly under the direction of an elected management. A part of the profit would be distributed in proportion to the land contributed by each farmer and the rest of the profit would be contributed in proportion to the wages earned by each farmer. If the farmer are not willing to have a full-scale co-operative farming, they can secure some of the economics by joining a particular form of co-operative organization namely, co-

operative purchasing, co-operative better farming, co-operative selling etc.

Co-operative farming is divided into classes: -

- a- Co-operative joint farming.
- b- Co-operative collective farming.

8. CO-OPERATIVE JOINT FARMING :-

The ownership is retained by the individual, but the land is cultivated jointly.

9. CO-OPERATIVE COLLECTIVE FARMING: -

In collective farming, the members of collectives surrender their land, livestock and dead stock to the society. The collectives cannot refuse to admit other members of required qualification. The members work together under a management committee elected by them. The committee direct from management in matter of allocation of work, distribution of income and marketing surpluses and putts all members into labour to see that the work is done efficiently.

10. MIXED FARMING: -

Mixed farming is a type of farming under which crop production is combined with livestock raising. The livestock

enterprise is complementary to crop production so as to provide a balanced productive system of farming. When the livestock begin to compete with crops when the same resource, the relationship between the two enterprises changes from complementary phase to competitive nature.

11. MARGINAL FARM: -

The farm is having holding less than one hectore. This limit only fore illigated area. The limit is based on factor as type of soil cropping pattern.

12. FARM ASSETS (INVESTMENT): -

This includes owned land, farm building (non-residential) well, livestock implements on the farm.

13. FARM BUILDING (CATTLE – SHED): -

A floor space (3 m. X 1.5) provides 4.5 sq. m. for the housing of a pair of bullocks under average conditions.

14. LIABILITIES: -

It includes the list of the different individual or firm to which the farmers own money.

15. FARM ENTERPRISES: -

The farm enterprise is an income-producing branch of the farm business, such as crops or dairy. Thus it is a type of business followed on the farm

16. CAPITAL: -

Capital is their wealth, which yields an income. There are two type of capital: -

(A) FIXED CAPITAL: -

The capital, which does not exhaust within single process of production. It may be used many times for further production. It includes buildings, implements and machinery etc.

(B) WORKING CAPITAL: -

Working capital is that capital the utility of which exhaust in single process of production. It includes in single process of production. It includes the hired human labour, rops, medicines, feed etc.

17. CROPPING PATTERN: -

Cropping pattern mean the distribution of cultivated area among the different crop relations followed on the farm in a particular period.

18. CULTIVATED AREA: -

It is the area under cultivation in any year, it takes in to account a particular area of land only once respective of the number of crops raised during the year.

19. CROPPED AREA: -

Cropped area refers to the total area under different crops taking during an agriculture years. If three crops have been taken in a season, then the area sown more than once is counted as many times as number of crops raised during the year.

20. CROPPING INTENSITY: -

The intensity of land used is reflected in the relation between total cropped area and sown during the year, when multiplied by 100, it given the percentage intensity of cropping.

$$\text{Intensity of Cropping} = \frac{\text{Total Cropped Area}}{\text{Total Cultivated Area}} \times 100$$

21. NET IRRIGATED AREA: -

It denotes the actual cultivated area irrigated out of the total cultivated area.

22. GROSS IRRIGATED AREA: -

It indicatives the cropped area irrigated out of the total cropped area.

23. FAMILY: -

A family is the composition of various numbers belonging to different status. It includes all members as adult male, female and children.

24. EARNER: -

An adult male family members above the age of 18 years working whole time on the farm is considered as an earner, or. A person who engaged in economically gainful work through out the year and his earning is sufficient to support himself and his family.

25. HELPER: -

A member of the family which is not able to earn inadequate by but he may help to earner by supporting human work when there

is the peak time and heavy load of work, the supporter is called to be a healer.

26. DEPENDENT: -

A person who is not engaged in economically gainful work out depends for his livelihood on the earning of the other earners in the family.

27. FARM FAMILY WORKER: -

Farm family workers are the number of farm family (earner) for whom work on the farm has first call on their time.

28. FARM WORKER: -

Farm worker include farm family worker (earner and permanent hired worker) working on the farm.

29. FAMILY LABOUR: -

Family labour is not a variable input but a fixed of production. It takes interest in long and irregular hours of farm operations. On small or marginal farm, family labour is mostly employed. But family is not a stationary unit; it is undergoing a cycle of growth.

Considering the trend in the growth of farm population, it is anticipated that the supply of the member to migrate.

30. HIRED LABOUR: -

Small and large farmers employ hired labour. But the labour cost is concerned more with large farmers as seriously limiting their net income. The necessity of hired labour occurs during the sowing time and more intensely at the harvesting period when there is a great rush of work to be finished within a few days.

The hired labour may be classified as under:

- (1) Year – round,
- (2) Monthly,
- (3) Daily,
- (4) Piece work and
- (5) Custom labour (exchanging labour with the neighbour).

31. MIGRATORY LABOUR: -

The labour migrates temporarily from the densely populated areas to other regions in search of employment particularly during the rush period.

32. PERMANENT HIRED LABOUR: -

Permanent hired worker is defined as all such male persons of vigorous working whose only is working on the farm where hired.

33. CASUAL LABOUR: -

It is a measure of the number of man-days of temporary hired labour employment as known casual labour.

34. FARM WAGES: -

Farm wages are mostly government by demand for and supply of farm labour. These are of two types: -

A- Nominal Wages: -

Nominal wages are paid in terms of money alone.

B- Real Wages: -

Real wages are generally paid both in case and kind that determine the standard of living of a labourer.

35. COST: -

The term cost refers to the outlay of funds production of services, cost are also involved in the right of franchise to carry on

the production process following type of cost is related with present study-

(A) FIXED COST: -

The cost, which is incurred on, fixed capital. It does not vary with the level of production for example depreciation, interest, repairs etc.

(B) VARIABLE COST: -

The cost, which is incurred on working capital which varies with the level of production for example cost of hired labour, ropes, medicines and cost of feeding, stuff etc. under crop of example expenses for seed, manure, fertilizers, labour, water change etc.

(C) TOTAL COST: -

It is the sum of fixed and variable cost. Thus fixed and variable cost on the farm from the total farm cost. The total cost stand even when the production is zero.

(D) AVERAGE TOTAL COST: -

It refers to the average of all costs (fixed plus variable) per unit of output.

(E) MARGINAL COST: -

Marginal cost (MC) is the change in cost associated with an increase of one unit of output.

(F) AVERAGE FIXED COST: -

Average fixed cost is a fixed cost per unit of output. Since the total fixed cost is the same at all the levels of production, the Average fixed cost falls continually at a decreasing rate as more output is produced. It is because the fixed cost is divided by increasingly large numbers as output increases.

(G) AVERAGE VARIABLE COST: -

The average variable cost (AVC) refers to total variable cost per unit of output.

36. DEPRECIATION: -

It refers to the less or decline in value which occurs intimate in items of fixed farm assets such as building, machinery, equipment and livestock etc.

37. GROSS INCOME: -

It is the value of total farm product (main and by – product) in the year. It is obtained by multiplying the main and by – products to their prices.

38. NET INCOME: -

The net income is the different between gross income and total cost incurred in production.

39. FARM BUSINESS INCOME: -

Farm business income is the gross income minus expenses of the production excluding wages of the labour and interest on working capital. It is a measure of the earning of the farmers and his family for capital investment labour and management work.

40. FAMILY LABOUR INCOME: -

It includes that form income plus off farm income i.e. the obtained from jobs as well as other than farm jobs.

41. LABOUR INCOME: -

“Labour income is the amount of money that the farmer has left after paying all business expenses of the farm, and deducting both the going rate of interest on the money invested in farm business and the value of the unpaid family labour other than operator’s”.

42. LABOUR EARNINGS OR FARMER’S EARNINGS:

Labour income plus the value of produce and privileges furnished by the farm constitutes labour earnings.

43. PRESENT RETURN ON CAPITAL: -

It represents the rate of interest received on invested capital after subtracting an allowance for unpaid family labour and the operation’s labour. It is calculated as below: -

$$\frac{\text{Farm income} - \text{labour income of family \& of the operator}}{\text{Average capacity investment}} \times 100$$

44. LIVING EXPENSES: -

The expenses incurred in maintaining of a family for their livelihood.

45. MILCH ANIMAL: -

Milch animal are those animal which are capable of producing the milk but may either dry or in milk during any part of the year.

46. COST OF MAINTENANCE: -

Cost of maintenance is the cost which includes the value of feed and fodders, human labour, cost used for up keep and production of milk and miscellaneous charges like depreciation and interest on the value of animals, cattle shed and cheff cutter etc.

47. COST OF MILK PRODUCTION: -

The cost, which comes after deducting the value of dung from the total cost, is taken as cost production of milk as known the maintenance cost.

48. INPUT – OUTPUT RATIO: -

It is the proportionate amount rupees over the per unit rupees of input value used in the production of output.

49. MAINTENANCE RATIO: -

That amount of ratio, which is given to animal for body maintenance.

50. PRODUCTION RATIO: -

That amount of ratio, which is given to animal for growth, production or work excluded from maintenance ratio.

51. ROUGHAGES: -

These fodder which have more than 18 percent of crude fibres and least amount of T.D.N. are known as roughage for e. x. straw, grass etc.

52. CONCENTRATE RATIO: -

These feed which have more than 60 percent T.D.N. but have least amount of crude fibre for ex. grains, pulses, cake are known as concentrates.

53. PREGNANCY PERIOD: -

It is the child-bearing period of animal for example pregnancy period for cow, buffalo and goat are 283 days, 310 days and 150 days respectively.

54. LACTATION PERIOD: -

It is the milk-producing period of animal. It varies breed to breed and animal to animal known as lactation period.

55. BANK: -

A general and somewhat vague term applying to a large number of different kind of financial institutions carrying an one or more of the functions of deposits, discount, investment, advancement and offering other financial services.

56. SCHEDULED COMMERCIAL BANK: -

Scheduled commercial banks are those, which are functioning according to a notification under the Reserve Bank Act, 1949. Banks, which have not less than 5 lakhs capital in reserve can alone be, schedule to Reserve Bank.

57. NON-SCHEDULED COMMERCIAL BANK: -

These are the banks, which are not on the schedule list of the Reserve Bank of India, or the banks, which are not functioning under the Banking Companies (Reserve Bank) Act.

58. NATIONALIZATION: -

Ownership and operation by the Central Government of a nation of some institutions or enterprises previously a private or local government undertaking.

59. BORROWER FARMER: -

It refers the farmer who has taken loans from the financial agencies till it is not repaid to that agency.

60. CREDIT: -

Credit is the ability to obtain goods or services of another person by promising to return it the pay for its use at the end of some agreed time in future! The word 'Credit' implies trust.

61. CREDIT REQUIREMENT: -

The money or goods required to meet the current expenses and for equipping the farm is known as credit requirement.

62. PRODUCTION CREDIT: -

The money of goods taken to meet the current expenses in dairying the farm is known as production credit.

63. INVESTMENT CREDIT: -

The money or goods taken for equipping the farm is known as investment credit.

64. INTEREST: -

A sum paid for the use of capital. The sum is usually expressed in terms of a rate or percentage of the capital involved, called the interest.

65. SELF LIQUIDATING LONE: -

Self-liquidating loans are those found (good and services) which are used for short – term purposes such as expenses seeds and fertilizers etc. which depreciate or are used up in the production process in one year or one production session.

66. LONE – LIQUIDATING LONE: -

Non - liquidating loans are those where required are not directly consumed or are consumed over a number of year.

67. RECOVERY: -

The term recoveries indicate the amount recovered by lending agency against the amount of lone advanced within specific period.

68. OUTSTANDING LONE: -

Outstanding lone is the amount, which remains unpaid, balances with borrower to pay when the time falls due.

69. REPAYMENT: -

It refers to the amount, which is refunded by the borrowers against the borrowing made.

70. CREDIT ADEQUACY: -

It denotes the availability of money or goods is required quantity.

71. REPAYMENT CAPACITY: -

It is the portion of the amount that a farm family will earn from a year's operations, which shall be available for repayment of the lone.

72. COST OF CREDIT: -

Cost of credit consist of interest to be paid and the expenses incurred for fulfilling the formalities to obtain lone such as expenses incurred in transport and communication in taken no dues certificate and other documents etc.

EVALUATION OF COST ITEMS: -

1. ANIMAL LABOUR: -

The animal labour has been valued at the prevailing rates of hired in the villages.

2. FARM PRODUCED SEED: -

Farm produced seed have been evaluated on the basis of their price prevailing in the village during the sowing period.

3. PURCHASED FARM SUPPLIES: -

Purchased farm supplies like manure, fertilizer and seed have been valued at their purchased price plus transport cost if any.

4. FARM BUILDING: -

Farm buildings have been evaluated from the basis of actual cost incurred in the construction.

5. FARM PRODUCED MANURE: -

The farm produced farmyard manure has been evaluated at the rate level and in the village during the period of use.

6. MACHINERY AND IMPLEMENT: -

The evaluation of purchased implements has been done on the basis of original purchase price less depreciation. These implements which are prepared locally and for which material such as wood, iron etc. are supplied by the farmers to the village carpenters have been valued at their market price.

7. PURCHASED LIVESTOCK: -

Purchased livestock have been evaluated on the basis of original purchase price plus appreciations or less depreciation.

8. HOME BREED LIVESTOCK: -

Home breed livestock have been valued at market price.

9. FARM PRODUCE: -

A farm produce has been evaluated on the basis of harvest price, which refers to the price prevalent during harvesting period when bulk of the produced is disposed off.

10. INTEREST ON FIXED CAPITAL: -

The interest on owned fixed capital has been calculated at the rate of L.D.B. i. e. 12% per annum. The interest on the fixed capital through borrowed funds is charged at the actual rate of interest. Charged by the banks on the borrowing.

11. INTEREST ON WORKING CAPITAL: -

The interest on working capital has been calculated at the rate of 10.5 percent for the half of the period the crop remains standing on the field.

REVIEW OF LITERATURE

ELWOOD M.JUREGENON AND MORTENSON W.P.

[1994], (1)

For the most part farmers give their attention to producing farm products and turn the job of marketing over so-called middlemen. About all the farmers attempt to choose their best local market out let. How ever during dairy farmers. In many are as have been quit active in marketing the products they product.

Co-operative bargaining association, though which they bargain with milk dealer for the prose to be paid for milk. The farmers do not handle the milk themselves. The turn it over to dealers who take over all the operation of marketing.

CLARENCE H.ECKLES AND ERNEST L.ANTHONY

[1995], (2)

Martin point out that the native races of Africa, America and Australia, which have never developed beyond the stage of barbarism, do not use milk as food. The primitive race of Europe and western Asia made use of milk, as there decedents have done and this fact according to marketing in no small degree may be the reason for the great intellectual development of Europe and America.

Large parts of the best and highest price agricultural of the world are utilized for keeping of dairy cattle. It is a well-known fact that the most prosperous nation, as well as the best development physically and mentally is those in which the dairy cow has long been the foundation of agricultural.

KESHARI, SANGEETA AND MALIK B.S. [1997], (3)

The production and consumption and pattern of milk products of rural household belonging to different and holding categories were studied in adopted village of dairy extension division, NDRI, Karnal hundred women's, belonging to different land holding categories and rising at least one milk animals were taken as the respondents. It was found that production and consumption was maximum in large farmers and at least in landless categories.

The consumption of milk and milk products depends upon various factors, which includes milk. Production socio-economic status season family size and food habits. The linkage between milk production availability and consumption is neither direct nor simple. It would be of interest to examine variation in the consumption of milk and its production different household. The present studies was therefore, take up as an attempt to ascertain the production lies between to different land holding categories consumption of milk and milk product.

SINGH VIR [1998] ⁴

Small holders in the hills have evolved 2 major systems **sedentary and migratory** systems of management under this system livestock are kept in a village throughout the year. Migratory systems of livestock management found at different location and stay there for a defined period. This is an essential feature of transhumance pasoralism being practiced by certain seat ions of societies in the region. During summer these animals are herded winter these animal slay in the lower hills or adjoining planning areas.

Dairy farming is one of the most promising enterprises, for small holders in Uttaranchal hills. An increasing trend in milk Production marketing and consumption rates suggests bright prospect of smallholder's dairy farming. Dairy production, many issues relating to smallholder dairy development in the region as be addressed dairy development specifics associated with these dairy production system. Natural and livestock resource management, proper feeding nutrition education and farming to smallholder dairy farmers hold the key to sustainable development of dairy production in the hills.

MATHUR B.N. (2001), ⁽⁵⁾

A state of the art commercial dairy plant was established during May 1995 at NIRI, karnal through the financial assistance of

World Bank and installed on turnkey basis by the National Dairy development board.

The plant has been designed to handle 60,000 liters of milk per day and one-lac liters of milk per day in the second phase of project implementation. The dairy plant has been set up with following objectives:

- To provide infrastructure for in plant training of the student of B.Tech. [Dairy technology] of the NDRI University for imparting experience in managing a modern commercial dairy plant and to is till confidence in handling real life problems in production management.
- To provide infrastructure facilities to the scientist of NDRI for scaling up R&D concept from laboratory scale to industrial sale under commercial environment.

SHARMA B.L. AND SHARMA R.C., (6)

The per farm net income received from dairy enterprises was Rs.10, 155. Percentage net return over total cost was 21.78 percent, which decreased with increase in the size of farm. Farm business and family labour incomes from dairy farming were Rs. 27,669 and Rs. 27,059 respectively. The crop farming contribution was 64.81 per cent and dairy farming contributed 35.19 per cent to the total income. In dairy farming, percentage share of total income

decreased with increase in the size of farm while reverse trend was observed in crop enterprise. Dairy enterprises provided maximum employment of 338 man-days and crop farming provided 219 man-days. Per worker employment from crop dairy farming were 80 man-days and 123 man-days, respectively. Thus, dairy farming plays a key role in increasing employment and income in the semi arid tract of Rajasthan.

CHAND KHEM AND GAJJA B.L., (7)

The study revealed an increase in buffalo population in the region while a sharp decline was observed in percent share of cattle in the total livestock population. The major deficiency of fodder was felt in the case of ovines in the arid region. The factors responsible for increase in buffalo population are increase-cropping intensity and rural population density in the arid region while the same factors resulted in a decrease in cattle population. The arid region farmers also adopted buffalo as drought resistance strategy since unproductive buffalo can be sold during drought, which does not affect the religious sentiments as in the case of cattle. The study recommends storage of forage produced in good monsoon year for use in the deficit period. The government of India is also implementing a scheme for this region to develop and rejuvenate the pasturelands available on a large scale to improve the livestock situation in the region.

SHIYANI R.L. AND SINGH RAJ VIR, (8)

The study revealed that, buffalo+ paddy+ fallow+ summer paddy+ sugarcane production system gave the maximum annual net profit of Rs. 26,904 over cost C-2 in Zone-I, whereas buffalo+ crossbred cow+ sugarcane emerged as the most profitable system not only in Zone-II (Rs. 64,298) but among all the system of Gujarat state. In general, buffalo+ groundnut +fallow+fallow system and buffalo+groundnut +wheat + fallow system were found to be most profitable in North Saurashtra and South Saurashtra zones, respectively. The profitability of different system was found relatively less in the case of Bhal and Kutch zone. The study suggest that concerted extension efforts need to be made to popularize the most profitable production systems among the farmers or livestock owners of the respective zone. The government most also accord higher priority to create better infrastructure and marketing facilities of the profitable enterprises.

KALAMKAR SHRIKANT S., (9)

The total livestock population in Maharashtra was about 3.96 crores, which is 8.71 per cent of the country's livestock population. The milch bovine population, which forms the base of dairy development in the state of Maharashtra was 84.52 lakhs, of which 61 per cent were cattle. Bovine population accounted for two-third of the total livestock population in the state. The cattle population

which accounts near about one-half of the total livestock and more than three-fourth of the total bovine population has increased, but its share in total livestock population has decreased. But still cattle constituted the major milch animal in the state. On the other hand, population of buffaloes showed an increasing trend. The pune region emerged as a region of largest population of milch animals and Nasik region as high livestock density region. The share of the state in country's milk production has increased from 5.61 in 1985-86 to 6.88 per cent in 2001-02, but still the per capita availability of milk is lower in the state as compared to national average. The growth in the dairy sector has been achieved due to Operation Flood programme which needs to be sustained and improved in figure in order to increase per capita income of the rural downtrodden masses. Although the co-operative sector had made significant improvement of dairy sector in rural areas, efforts should be made to include more areas under the co-operative set-up. The institutional and organizational support in terms of credit delivery and insurance should be stepped up to boost the performance of dairy sector.

AWASTHI MAYA KANT, (10)

The findings of the study reveal that despite the existence of global competitiveness at the basic producer levels, our competitive strength is reduced considerably when compared to global competitiveness at the finished product level, on account of

inefficiency at marketing and the product processing stage. The problems get further aggravated due to very high tax structure. Thus increasing production and processing efficiency along with more favourable tax structure in the livestock sector will be critical for realizing the enormous export growth potential of animal products in India.

SINGH NARESH AND SIDHU J.S., (11)

The study revealed that, dairy farming accounted for more than one-third of land and farm investment, more than two-third employment of family labour, 60 to 90 percent of the family income and more than one-third of the domestic expenditure of the small and marginal framers. The viability of these small economics rests on the optimum integration of dairy with crops by utilising their scarce land resource and surplus family labour. Although, the small and marginal framers were able to minimize the gap between existing and potential productivities of different crops, they failed to bridge the gap in the case of milch animal. The study suggested that a lot of efforts are required on the part of the government and other development agencies to develop high milk-yielding animal breeds, milk production technologies supported by training and extension service, credit, animal health service and effective pricing policy through co-operative milk marketing facilities, to make these tiny enterprises viable.

KAMBLE S.H., TILEKAR S.N. AND VEEKAR P.D. (12)

On all purposively selected sample farms, the share of local and crossbred cow and buffaloes were to the extent of 12 percent, 68percent and 20 percent respectively. The dominance of crossbred cows was the effect of Intensive Cattle Development Programme. However, possession of crossbred cows was on an average more or less same on small and medium sample farms while it was higher on large farm. The results have shown that the crop production activity resulted in loss on small and medium farms, while it was profitable on large farms. The study concludes that dairy enterprise helps in minimizing the economic losses on small and medium farms, while replacement of local milch animal with crossbred augment the net income substantially on all farms.

SINGH R.K., BABU GOVIND AND SINGH BABU, (13)

The present paper focuses on the livestock wealth and attempts to work out the trends in production of milk, meat, eggs and other products in Uttar Pradesh for judging its future potential. The analysis is based on census and secondary data obtained from various sources. The analysis of data indicated that the annual compound growth rate of agriculture was 2.3 per cent during the 1990s as against 2.9 per cent in the 1980s. Crop; livestock, fisheries and forestry constitute the core sectors of agriculture. Crop sector is

the principle source of generating income in agriculture followed by livestock sector. The share of crop sector has declined by 3 per cent from 79 per cent in TE 1981-82 to 76 per cent in TE 1997-98. The share of livestock sector, on the other hand, has grown by 6 per cent from 18 per cent in TE 1981-82 to 24 per cent in TE 1997-98, while the share of forestry and fisheries is too meager in the state. Livestock sectors, thus, is an important component of agriculture. This sector is growing impressively in Uttar Pradesh. It is reflected from the increasing share of livestock in the gross value of agriculture output from 18 per cent in TE 1981-82 to 27 per cent in 1999-2000. Annually the state produces more than 11 million tones of milk and small ruminants. The share of milk production has grown impressively in the value of livestock output. The potential of this sector has not yet been fully realized. This sector has still great potential to raise the income of the small farm holder and act as an important source of livelihood for the small and marginal farmers. Unlike land, the small and marginal farmers own greater share of cattle and buffalo than the large farmers do. Special emphasis should be laid on this sector to raise income and generate employment opportunities for the landless labourers, marginal and small farmers. The markets are not efficient for trade in livestock and livestock products. Marketing of livestock animals, cattle milk an milk products meat (goats, poultry and pigs) and eggs, wool hides and skins is inefficient in U. P. Hence efforts are required to improve the marketing requirements and production technologies have to be tied together, which would boost the sector. The study

has suggested that market prices, practices and facilities should be designed in such a way as to give favourable net returns to the farmers.

PATHANIA M.S. AND VASHIST G.D. (14)

The present study is based on a field study, which has been supplemented by secondary data. For the purpose of study, a sample of 150 dairy farmers was randomly selected from all the four agro-ecological zones of the state. Secondary data relating to livestock population, livestock development programmes, health care development, breeding milk production and yield etc. were also collected. The study revealed that the livestock population of crossbred increased, while a perceptible decrease was noted in case of indigenous cattle. The various livestock development programmes started by the government showed an increasing trend over the period of study.

The findings of the study have clearly brought out that there was a positive impact of livestock development technology in Himachal Pradesh. The important constraints faced by sample farmers in the adoption of technology were the unsuitability of bullocks for ploughing due to absence of hump, lack of knowledge of proper animal health care, higher sterility rate in females, low level of use of concentrates, lower conception rate, lack of knowledge of high-yielding varieties strains of fodder, scarcity of

land for cultivation of fodder, lack of availability of animal nutrition bricks in time and lack of knowledge about the benefits of brick technology, lack of knowledge of diseases, expensive medicines and lack of mobile van facilities. Most of the constraints faced by the farmers could be removed through extension education of livestock keepers and by the providing training to them. The research and development efforts must be betterment adoption of livestock technology. There is also need for development of complete package of practices which will go a long way in dissemination and adoption of livestock technology. Research and development efforts need to be focused on breed improvements, improving feed and fodder availability, disease prevention and control etc.

**RAO NEERAJ, KUMAR PRASANT, PAL GOVIND AND
SEN CHANDRA** ⁽¹⁵⁾

The present study was conducted in 2001-02 to examine the economics of milk production and resource use efficiency in the milk production in district Kanpur (Delhi) of Uttar Pradesh. Two blocks from the selected district and five villages from each selected block were selected randomly in proportion to the number of farmers categorized under three size groups of 0-1, 1-2 and above 2 hectares. Production function analysis was used for determining the efficiency of various resources used in the process of milk production. The study reveal that the total maintenance cost of a

milch animal per lactation increased as farm size increased. On an average the maintenance cost of a milch animal during a lactation period came to Rs.10, 278.63. Amongst all costs labour charges accounted for the highest share followed by fodder and concentrates. The gross income from concentrates by large farmers. Input output ratio was the highest on small farms and it was 1:1.31. Elasticity of production for fodder was the highest followed by human labour and concentrates for all farms. The marginal value productivity analysis shows increasing milk production and there is great scope for training facilities on modern animal husbandry, reasonable price of concentrates and planned milk marketing facilities will certainly help in enhancing milk production and profitability in the study area.

BEOHAR B.B., MISHRA P.K. AND NAHATKAR S.B. (16)

Regarding the availability of infrastructural facilities in the selected markets it was observed that non-availability of credit, lack of funds, lack of insurance, more marketing charges, involvement of intermediaries, unfavourable role of local bodies, unlicensed intermediaries and high animal health center, credit, insurance (except Chhindwara), feed fodder facilities and drinking water were available in the markets but cattle shed / lodging- boarding all the main animals ranged between 79-92 per cent. It was the lowest in case of goat and highest in the case of cows and buffaloes. It was

also observed that brokerage charges in the marketing of livestock is the key component sharing maximum percentage of total costs. Regulatory measures are necessary to minimize the exploitation from brokers, only licensed brokers should be entertained. Information network for livestock markets are to be developed, markets should be well equipped by all facilities, records of arrivals and disposal of livestock should be maintained by local bodies. The banking hours should be in tune with the market hours. Livestock transportation is banned in trucks, but unauthorized transportation is still counting, because of this police exploit the traders, which ultimately enhance the marketing cost.

SINGH J.P. "GROWTH OF LIVESTOCK ECONOMY, (17)

The study suggests the need to establish milk co-operative societies as per Anand model to perform efficient disposal of milk as well as input supply, opening of more artificial insemination centers, timely vaccination facility, arrangement for better health care with easy reach and provide adequate knowledge for processing of milk based products. For making efficient goat meat marketing system, goatery owner's co-operative society/ self- help groups are to be encouraged for performing disposal of goat meat directly to the consumers/ hoteliers/ restaurant on continuous basis. Determination of prices of goat meat are to be followed by considering age, sex and breed and breed and breeding improvement for goats are to be popularized.

KURUVIAL ANIL, NASURUDEEN P., BINUKUMA D.
AND RAJNI R. (18)

The improvement in economic access to food made possible by income growth has resulted in higher consumption of livestock products, especially milk and eggs. Though the absolute consumption expenditure on livestock products increased in the urban areas, the percentage share of these products in total expenditure did not vary much in different rounds. The share of consumption expenditure on milk products increased from 7.29 per cent in the NSS 27th Round to a maximum of 9.49 per cent in the NSS 50th Round and then declined to 8.75 per cent in the NSS 55th Round in rural areas. The divergence between rural and urban areas of expenditure on livestock products declined in the recent round. The major source of protein for majority of the population is cereals and pulses. There is a convergence between rural and urban patterns of calorie and protein consumption in spite of the long-term decline in calorie consumption. The contribution of milk and milk products as a source of protein is consistently increasing and the increase was more in urban areas. The contribution from meat, fish and egg to protein slightly increased and was found to be higher in urban areas. At lower income levels, cereals dominated the food expenditure pattern, followed by vegetables, pulses and milk in the rural areas. However, with the rise in income the expenditure on livestock products particularly milk rose dramatically. In urban areas, milk products are found to be significantly important even at lower

income levels. As income levels rise, the importance of livestock products in the consumption basket also increase.

CHOUDHARY V.K., GODARA R.K. AND LAKHERA

M.L. (19)

The dairy unit consists of improved cattle buffalo (Murrah) and cows (Holstein Friesian, Jersey and Sahiwal). Primary data has been collected from the dairy farm from July 2001 to June 2002 for the purpose. It was found that the cost of milk production was the highest for Holstein Friesian followed by followed by Murrah. The returns of milk production was gained maximum by Holstein Friesian followed by Jersey and buffalo. The effect of concentrate on milk output was found to be highly significant in almost all the seasons. Labour also showed its significance in summer season. The study suggests that highly- yielding exotic breeds like Holstein – Friesian and Jersey should be reared, and to generate more net income, market integration practice should be adopted to reduce the channel of marketing.

KONDAL RIKHI R., SHARMA RAMESH CHAND AND

SHARMA B.R. (20)

An attempt has been made in the paper to study the cost and returns from dairying enterprise and the possibilities of increasing the productivity of milk in Bilaspur district of Himachal Pradesh.

Lanjhta village of this district was purposively selected because it is one of the progressive villages in the district and has a veterinary dispensary situated in the village. A total of 45 households comprising semi-marginal, marginal and small farmers were selected through survey method and the data pertained to the year 2003-2004. The result indicate that the production of proportion of milch improved cows is much less in the total livestock population mainly because the artificial insemination is not successful in the study area and this facility was also not available in the village veterinary dispensary. The seasonal variation in the feeding system affects the yield of the milch animals. The yield gap of improved cow over local buffalo was found to be 55.14 per cent in the overall farm size. The study levels that in the overall size farm size 55.41 per cent milk of improved cows was retained for family consumption, out of which 35.61 per cent was processed for ghee. So for as buffalo's milk is concerned, about 77.86 were retained for home consumption, out of home consumption 39 per cent was processed for ghee. Since the market is local, there was no marketing margin. Thus the improved cows are found to be more profitable than buffaloes

DIXIT P.K., DHAKA J.P., SAJEESH M.S. AND
ARAVINDA KUMAR M.K. (21)

However, lack of green fodder, dry fodder, non-availability of land for fodder, high cost of feeds, low price of milk were the constraints reported by the sample households in milk production. The study suggests the creation of fodder banks, added facilities of veterinary and health care services, improved banking service for dairy sector, guidance of the extension team and better network of dairy co-operatives promotion of healthy linkage among developmental agencies, research institutions, dairy federation and farming community must be encouraged.

**SUJATHAV.R. ESWARAPRASADY., SRILATHA CH.
AND ARUNAKUMARI A.** (22)

The market structure analysed using Hirschman- Herfindahl index for the presence of monopoly indicated the H value of 2.31 per cent, denoting the lack of monopoly in milk marketing. To estimate seller's concentration, Bain's classification was used according to which farmers are said to constitute an "atomistically competitive" market. Four marketing channels were identified for milk marketing in coastal in channel I. Price spread was minimum channel I and highest in channel IV. The highest price spread is due to the fact that the intermediary incurred some costs and retained some portion profit, which added to the inflated price spreads. Channels I was found to be the most efficient channel with a marketing efficiency of 99.81 percent. It was observed that in all the channels price paid to the producer was high in the private sector

compared co-operative sector. It was also found that price spread was less in private sector and hence the consumer price was also less. The major constraints identified in milk marketing were high feed cost, inadequate price for milk, poor credit facilities, disease outbreak, etc. Because of delay in the payment of fee for the milk sold to the co-operative society, the farmers approached the private firms. For enhancing the marketing efficiency of milk, infrastructure facilities like chilling plant, pasteurization and dairy products processing plants have to be developed.

DUHAN K.VINOD, KHATKAR R.K. AND SINGH V.K. (23)

The paper is based on a study conducted with reference to 120 respondents scattered in six villages of two blocks in Rewari district of Haryana to analyse the nature of market and role of co-operatives in marketing of milk. It was observed that on medium and large category of farms the milk sold through co-operative was found to be higher than the disposal through milk vendors and directly to the consumers mainly due to more marketable surplus. While on small farms the disposal was found to be almost equal, i.e., 3.5 per cent through milk vendors and directly to the consumers, and the disposal of milk through co-operative was less due to lower marketable surplus owing to smaller herd size. Further, it was observed that although there is difference in the average quantity sold through different channels, yet it was found

significant. That small category of farms were selling relatively lower share through co-operative in all the three seasons. The study medium farmers accounted for a higher share of producer in the consumer rupee could be increased by strengthening the co-operative sector. Thus, there is a need to expend the milk co-operative societies to cover all the milk producers in the rural areas, which will generate higher marketed surplus of milk and in turn provide remunerative prices to the producer on regular basis. Timely supply of necessary inputs to dairy farmers at cheaper rates, timely payments and reasonable price for their milk by the dairy co-operatives could motivate the dairy farmers to sell their marketable surplus milk through co-operatives. Seasonal fluctuation in prices of milk can be controlled through the intervention of milk co-operative societies. The establishment of milk processing units by the co-operative sector and provision of refrigerated vans and storage facilities can overcome the major constraints faced by the producers in marketing of their milk. Thus, co-operative have a big role to play in marketing of milk products in the rural areas.

SINGH R.B. AND DAYAL REKHA, (24)

The study examines the economics of production and marketing of milk in the state of Uttar Pradesh. Linear and log-linear functions were used to work out the estimates of factors affecting marketed surplus of milk both for the private and cooperative systems. The results of the study indicate that the feed

and fodder cost was the most important item of the total maintenance cost accounting for 55 to 65 per cent of the total important item of the total maintenance cost accounting for 55 to 65 per cent of the total cost in zone I and 51 to 66 per cent in zone II. The net profit per day a milk buffalo was very low due to the higher maintenance and low milk yield of milch buffalo on each herd size group in each zone of the state. The net profit of milk production per buffalo per day was observed to be higher in the case of small size group due to higher milk yield of milch buffaloes in this size group as compared to medium and large herd size groups in both the zones. Price of milk was found to be most important factor influencing the volume of milk business significantly, besides production level. The establishment of milk co-operative societies in the rural areas had positive impact on the marketed surplus of milk. The study further showed that the milk vendor being an important intermediary in milk marketing made huge profits by adopting various types of malpractices.

TOMER B.S., MALIK D.P., SINGH V.K. AND KAPOOR KIRAN, (25)

The study thus revealed that the livestock maintained on the farms in the state constitute mainly the bovine milch animals and its size was positively correlated with the size of land holding. However, with per unit of land area, the number of livestock declined sharply. This in turn indicates that the small farmers

increase their volume of business through maintaining proportionately higher number of milch animals per unit of land area than the large farmers. The dairying enterprise therefore, was providing employment to the unemployment and under employed rural work force. Thus, the development of dairying in the state can go a long way towards enhancing the income and employment, in addition to the complementary and supplementary relationships of dairying with crop enterprise.

SHAH DEEPAK, (26)

The study attempts to evaluate the output and export performance of India vis-a- vis Asia and the world in terms of livestock product during the year 1982-96. The data used in the study show considerable increase in the export trade of India in meat and meat products and also in respect of milk and milk products, both in quantity and value terms. The export trade of India in milk and milk products received a boost only after the early 1990s, i.e., in the era of liberalisation. The study shows an increasing trend in export trade of India in processed livestock products. The increase in livestock in export trade of India witnessed after the early nineties period is mainly due to liberalization of trade and several trade policy changes coupled with surge in international prices of many livestock based products. The upswing in live exports of India in due course of time has also filtered in to significant increase in her share not only in Asia but also in world

export trade. But, the results of this study indicate a marginal presence of India in world trade of majority of the livestock products. It is only in the case of bovine meat and also sheep and goat meat that India has shown a considerable share in the global trade of the same. The findings of this study also indicate that there will neither be any exportable surplus for milk nor meat and eggs in the near future. However, India still has enormous potential and direction can lead us to emerge as the leading producer of milk and meat in the world in the years to come.

KUMAR VIRENDER, SHARMA H. R. AND

SHARMA R. K., ⁽²⁷⁾

The study has examined (a) the relative importance of livestock in terms of its contribution towards gross state domestic product across district, (b) spatial and temporal changes in the composition of the livestock population and (c) the ecological implications of livestock pressure for the natural resource base of the state of Himachal Pradesh. The findings of the study revealed that during the past twenty-five years while there had been an increase in the population of cattle, buffaloes and goats the population of cattle and sheep declined. Across district, the per cent share of cattle in the total population declined markedly in Una, Kangra, Hamirpur and Bilaspur districts followed by a marginal decline in Solan, Chamba and Sirmaur districts. The share of cattle in total population increased in the districts of Shimla and Lahaul

and Spiti. And in those districts where the per cent share of cattle in total population had declined, there was an increase in the percent share of buffaloes except in Kangra district. The per cent share of goats increased in Bilaspur, Chamba, Kangra, Sirmaur and Solan. Further the number of indigenous cattle per crossbred cattle had also declined significantly from 17 in 1982 to 5 in 1997. In a similar vein, the number of indigenous bulls per crossbred bulls also decreased from 22 to 12 between 1982 to 1992. All the districts, with the notable exception of Lahaul and Spiti, registered a decline of varying degree, the perceptible fall in the number of indigenous bull could be explained in terms of increasing incidence of mechanisation in these districts as was evident from the increase in the number of tractors per thousand hectare of net sown area. The livestock intensity, which is an indicator of the livestock pressure on land and other natural resources, increased from 84 animals per sq km in 1972 to 92 animals in 1997; and among the different districts, the increase in livestock intensity was more marked in Bilaspur, Chamba, Kangra, Mandi and Solan. The analysis further revealed that the number of work animals per thousand of net sown area was positively related to geographical area, proportion of small and marginal farmers, proportion of net sown irrigated and cropping intensity area and negatively related to the extent of mechanisation. The ovine population was also found to have positively relationship with geographical area having direct implications on the fragile environment and eco-system of the hills and mountains.

PANT D.C. AND BAWEJA NAVIN, (28)

The study revealed that the highest increase in population was recorded in buffaloes followed by pigs, sheep and goat. The population of male cattle decline by 5.57 percent. This was mainly due to mechanization of agriculture as there was more use of machine power in place of bullock power. The population female cattle has increased as male cattle were sold after the age of 1 or 2 years and females were maintained for milk production. The density per square kilometer of different types of animals increased in 1997 over 1992 except in the case of male and camels. The density of total livestock per sq. kilometer increased from 138.94 animals in 1992 to 158.18 animals in 1997. The share of different types of animals to total livestock population were almost the same in both the years. The share of goat population was the highest followed by sheep, cattle and buffalo in both the year. The contribution of buffalo milk was the maximum. The meat and egg production has also increased tremendously in 1997-98 over 1992-93.

AWASTHI P.K., RATHI DEEPAK AND GUPTA J.K. (29)

The livelihood analysis of resource poor farmers reveals that farmer's livelihood is maintained partly by crop and livestock production and partly by sale manual labour. The singular approach

of milk co-operative societies only by support those who have marketing surplus of milk, but the fact remains that most of the resources poor farmers of the drought prone area do not necessarily have a continuous flow of milk round the year or over a few years. A time the farmers face unforeseen difficulties, which come intermittently and ruin all the micro-investment-initiatives of the farmers in the drought prone and difficult areas. The study concludes that a mechanism to support the farmers and with stand the difficulties can occur only if their approach of diversified livelihood option to crop up with complex diverse and risk-prone environment and the development initiatives are design accordingly.

MONDAL R.C., (30)

The productive potential of goat depends upon the quality of nutrition. As goat is fed on grazing, it can hardly get adequate nutrition. Hence the reproduction and productivity rates of goats are still below the optimum levels. Since goats are usually sold for emergency purposes, market mechanism has little role to play, so far as the trading of goat is concern. Taking advantage of the system, middlemen usually take away a handsome profit from the transaction of goats. It is suggested that the different government departments like, animal resources development department, financial institutions, non-governmental organization, veterinary department, etc. should come forward to help the goat rearers by

providing arrangement for loan and assistance, veterinary services, development of pasture and grazing lands, introduction of hybrid variety of goats, improvement on the exciting nutrition, genetic and health care services, regulated market and insurance faculties etc.

SUBRAMANIAN M. AND VERMA N.K., (31)

The net cost of rearing calf up to the age at first calving in small farmers categories for cross-breed, local and buffalo calves was observed to be Rs., 8,041.22, Rs. 8,038.90, Rs. 7,891.66, respectively. Feed cost emerged as the major component of cost, accounting for about 68.42, 56.70 and 49.43 per cent of gross cost in the respective breeds. The small farmers realized a profit of Rs. 1,88.80, Rs. 717.35 and Rs. 1,093.34 from cross-breed, local and buffalo calves. The observation based on 48 cross-breed, 40 local and 16 buffalo calves for medium farmers stabilized that the average net cost at the age first calving was Rs. 7,781.31, Rs. 8,027.25, Rs. 7,074.18 for the respective breeds. The profit obtain from sale of animals was more in the case of cross-breed calf (Rs. 1,891.69) followed by buffalo calf (Rs. 1,717.82) and local cattle calf (Rs. 651.25). The share of buffalo calves in the cattle market was predominant in relation to cross-breed and local cattle calves respectively. The findings of the study indicate that calf rearing is an economically viable proposition under rural set-up. It holds

promising future in the livestock sector for income and employment generation.

LOKANABHANK K., LOGSMSTHA D.,
SUBBALAKSHMI L., MANI K. AND KEMPRAJ T., ⁽³²⁾

The results of the study showed that under rainfed and ground water irrigated saturations, the farms were small and milch animals maintenance was constrained by the availability of dry fodder and roughages even though some areas were devoted for fodder sorghum cultivation. The average milch animal maintained was 2 per ha in CBFS whereas it was five per ha in LBFS. The sheep and goat maintained under LBFS was more than the CBFS. The poultry was maintained under LBFS only 3,000 and birds were maintained by the farm households. The gross income earned in CBFS was Rs. 52,590 per ha of which the share from crop activities was 70.62 per cent followed by income from livestock in capital LBFS, the gross income earned was Rs. 6,99,780 per ha and the major share has been obtained through poultry (83.22 per cent). Among the variables included in the function farm women labour and expenditure on other inputs significantly influenced the gross farm income. Thus the livestock rearing is a remunerative activity with respect to income and employment generation and farmwomen contributed more than other labour to the income generation.

CHAUHAN A.K., SHARMA SATYA PAL AND SINGH RAM, (33)

The results of the estimated production function revealed that the productivity of the lactating animals is observed to be one of the important variables with statistical level of significance at 5 per cent level. This indicates that the productivity of animals affect the per capita milk availability in different states. In the light of these observation the study suggested that disparity in per capita availability among different state can be reduced by increasing the productivity of animals by introducing high-yielding animals, enhancing fodder availability in deficit state and increasing the ratio of wet animals in the bovines stocks.

SINGH RANVEER AND KAROL ANSHUMAN, (34)

The concentration of buffaloes is higher in low hill areas whereas cows are predominant in mid and high-hill areas. The demand and supply projection suggested that excellent opportunity exist for significant brought in small holder dairying with a probable rise of about 145 per cent in milk demand over the next 19 years. The most important variable observed in the success and failure of dairy co-operative is accountability. The price of milk offered by the milk fed is quite low and is reported to be non-remunerative by the farmers. In remote areas of the state there is considerable quantity of

milk available for sale but can not be disposed of, as there are no marketing facilities in some areas where traders operate the prices offered are low. The dairy farmers located in such areas do not have the knowledge of co-operative milk marketing. To improve efficiency of milk marketing system there is a need for training and advocacy of co-operative principal. Existence of a marketing channel is a pre-condition for augmenting surplus milk production. Milk marketing has to be finalized for a cluster or a group of villages rather than going in for organizing the producers.

PUROHIT S.G. AND JAMBAGI H.G., ⁽³⁵⁾

The study reveals that on a household, generally maintained more milch maintained animals compare to young stock. It is more in case of new animal breeds of cows and buffaloes compare to local breeds. But among milch animals, in the case of cows, the percentage-milking animal is more among cross breed cows compared to local cows but on the other hand in the case of buffaloes face buffaloes milking animals are slightly higher in local buffaloes compare to graded buffaloes. The employment opportunities are also more in new breeds compare to local breeds. The percentage involvement of women is more in all the type of breeds but comparatively more in both the breeds of buffaloes. Per animal per annum production of milk is more in both new breeds compare to local breeds. Prices of milk and milk products are reported to be more in both the breeds buffaloes compare to cows.

From the study it is observed that both new breeds are more profitable compare to local breeds. Maintenance cost per milch animal per year was more in both new breeds compare to local breeds and the percentage of operational cost are more in both local breeds of cows and buffaloes as compare to both new breeds. The study emphasizes that since dairying is the most important activity in supplementing the income and in generating employment opportunities, while extending loans under different dairy and rural development programmes by the government emphasis should be given to new breeds along with the package of credit, veterinary, marketing and other facilities as new breeds are more profitable than local breeds.

**REDDY M. JAYACHANDRA, REDDY Y.V.R. AND
RAMAKRISHNA Y.S.** ⁽³⁶⁾

The paper attempts a comparative study of economics of milk production in three states, viz., Chitoor district in Andhra Pradesh, Erode district in Karnataka involving aspects related to exiting cost structure of milk production, profitability of crossbred dairy cows in the three states under the changed socio-economic- political sccnario and also suggest methods to improve the viability of these enterprises. The data were collected by survey method during the year 2003. Seventy-five farmers were selected at each location giving due importance in the selection of all categories of

households. The number of dairy cows studied were 108 in Chittoor, 178 in Erode and 84 in Kolar districts. The net cost of maintenance of a crossbred cow per day was worked out to Rs. 38.99, Rs. 49.36 and Rs. 48.88 in Andhra Pradesh, Tamil Nadu and Karnataka respectively. The cost per liter of milk work out to Rs. 5.48 , Rs, 7.20 and Rs. 5.84 in the same order. Feed cost was the major component in grows cost, which accounted for 63.88 percent in Andhra Pradesh 72.14 percent in Tamil Nadu and 73.62 percent in Karnataka. The net profitability varied from 43 percent in Tamil Nadu, 70 percent in Andhra Pradesh to 83 percent in Karnataka. The variations among the three-studied location are due to variation in breed, feeding pattern, mamtenance of animals, etc. The study has further brought out the fact the higher fat content provides higher prices as milk is priced based on fat and solid –not –fat (SNF) content by dairies. Hence proper/ scientific breeding produce is to be followed to improve fat content in the milk as well as milk production per animal. Besides scientific breeding, feeding, treatment and veterinary care and management would not only increase milk production and fat content in addition to reduction in cost, but also incomes of farmers. Thus dairy farming is considered as an ‘instrument for socio-economic change’ in rural areas.

SAIKIA ANUVA, (37)

The percent study was conducted in six districts selected from six agro- climatic zones of Assam covering 900 households. The

study discusses about the structural composition of livestock, utilization of livestock in agricultural production and returns from milk production. The study pertains to the year 2001-02. The findings of study indicate that local cattle is the major livestock in all zones constituting 84 per cent followed by buffalo at 14 per cent while cross bred cows constituted only 2 per cent. Utilization of draught animal for agricultural production depended on cropping pattern and intensity. Out of total labour days for draught animals, 92.61 per cent was for rice cultivation, 2.71 for jute, 2.68 for vegetables, 0.8 per cent for oilseeds, maize, wheat and sugarcane while 1.17 per cent was for transportation. Thus livestock plays a crucial role in the agricultural production system as the major source of draft power. The study stresses the need to strengthen the feeding practices, breeding management facilities, animal health care facilities, etc., to enhance milk production.

**GOVINDARAJAN K., SHANMUGAM T.R. AND
KARUNAKARAN K.R.,⁽³⁸⁾**

The study aims to explore the population dynamics of the draught animals utilized in the farming operations in Tamil Nadu. The study has further explored the changes in the cropping pattern and how it has affected the population draught animals. For the purpose, survey were conducted under cost of cultivation scheme covering 600 farms in Tamil Nadu during 2001-02 to analysis the pattern of

animal power utilization. The data were collected by cost accounted method. The secondary data on population of livestock were collected from various Livestock Census Reports. It is evident from the analysis that though the increase was seen absolute number but it has shown a declining trend in relative terms, i.e., animal population per hectare of net sown area in Tamil Nadu but it was plateaued for the nation as a whole. As far as the farming operations are concerned the large sized farms utilised more number of pair-days than the small sized farms. This was because small farmers were unable to maintain animals separately for milk and draught purposes. The cost of maintenance was yet another cause of concern in catalysis the declining population of draught animals. The cost of maintenance per bullock has also increased with increase in farm size. However, the cost of maintenance per day of work per bullock decreased with an increase in farm size and it was mainly due to a larger utilization of farm animals in big farms. Further, the declining area under cereal crops has hastened the process of decline in the draught animals stock over the years. The study concludes that the increased cost of maintenance, spurt in the number of tractors and the decline in area of cereal crops were found to be the causative factors for the decline in the draught animal population.

THAKUR C.L. AND SINGH V. C., (39)

Surveys were conducted in the year 2003-2003 to assess the energy and cost requirements for milk production in different

commercial dairy farms in four locations, viz., Maharajpur, Imaliya, Pariyat and Mohaniya, around the Panagar block of Jabalpur district, representing the Kymore plateau and Satpura Hills zone of Madhya Pradesh. The locations for conducting the survey was selected at random without following any statistical method as there are enough number of commercial dairy farms to get a good comprehensive data on the different activities in milk production. The animals were all purchased costing between about Rs.15, 000 to Rs.20, 000 per animal. The total number of milch animals were 376, 644, 1,797 and 76 at Maharajpur, Imaliya, Pariyat and Mohaniya, respectively. The energy or cost consumption per day per animal was the highest in Pariyat dairy farms followed by other three dairy farms. The performance of commercial dairies surveyed in the four areas indicated that the cost of production was higher in Mohaniya dairy farms followed by Maharajpur, Imaliya and Pariyat dairy farms, respectively. The output input energy/ cost –benefit ratios of main product (milk) was higher in Pariyat area and lowest in Mohaniya dairy farms. The value of specific energy and output and input energy performance of dairy farms in Pariyat area was the best among the other surveyed dairy farms. It is inferred that cattle raising is not only an important occupation for supplying the nutritional diet to the people but also it has greater concern to uplift the socio-economic status of the people related to agricultural sector. Likewise raising goats, cows, buffaloes and birds as a supplementary occupation in the agricultural sector is apparently most economical for the development of socio-economical status of

rural people particularly in weaker sections, having small and marginal holdings or low investment capacity and tribal communities.

RAJPUT A.M. AND YADAV SANDEEP, (40)

A study was conducted in Indore district of Madhya Pradesh to study the economics and identify the constraints relating to cross-bred cow milk production. Specifically, it examines the cost and returns per year, the net return, cost of milk production per liter and benefit-cost ratio on small, medium and large size-groups of cross-bred cow farms. Multi-stage stratified random design was used for the selection of the ultimate unit of the sample. Indore block of the Indore district was selected for the study and five villages were selected randomly from Indore block. In all 50 milk-producer householder (cross-bred cow) were selected for one lactation period covering the agricultural year 2003-2004 and the data was collected by survey method. The results of the study revealed that, on an average, the total cost of maintenance of a cross-bred cow per annum was worked out to Rs.21, 657.76. After deducting the income received from cross bred cow dung and sale of young stock, the average net cost of maintenance came to 19,942.15 per cross bred cow. The farmers of large size groups had incurred higher expenditure on the maintenance of a cross-bred cow as they had

maintenance cross-bred of relatively better breed and had made higher investment on fodder and concentrates for maintaining them.

However, large numbers of cross-bred cow dairy entrepreneurs complained that the weak financial status, cost factor and management difficulties were the main constraints in not maintaining good quality of animals on the farms. The respondents' farm families strongly expressed the dire need for finance for the purchases of animals and also for feed, fodder and veterinary aid. A large number of commercial crossbred cow dairy entrepreneurs reported insufficient storage facilities on their farms. Milk and milk products fall under highly perishable group of commodities and have to be stored under controlled condition of temperature and humidity in cold storage and deep freezers. The cross bred cow enterprise should be organized as an independent enterprise on commercial basis by providing capital and credit at subsidized rates and encouraging the establishment of more co-operative societies to provide production and marketing services to the dairy farms in rural areas of Madhya Pradesh. Government should encourage and help milk producers in organising co-operatives since they are poor and illiterate and cannot do so themselves.

JANGID B. L. AND ROHILLA P. P.,⁽⁴¹⁾

A total of 118 farmer respondents owing at least one or more adult unit of cattle or buffalo were selected from two villages, one

each from two tehsils of Pali district of western Rajasthan. Data were collected using pre-tested personal interview schedule during the year 2000-01. The findings of the study clearly revealed that non-availability of green fodder round the year, lack of artificial insemination facilities, lack of improved breed of milch animal, lack of training about improved practices, low risk bearing Capacity, high cost of fodder and concentrates, high cost of modern medicine, non availability of loan facilities, lack of initiative and motivation, traditional attitude of people, uncertainty of monsoon, lack of information about various development programmes, and non-availability of extension services were the major constraints conformed by the farmers in the adoption of improved animal husbandry practices. There is a need to keep all these constraints in mind while developing any transfer of technology or extension programmes meant for the farmers of arid fringes in order to popularize the improved animal husbandry practices.

PAL KRISHNA PRAN, ⁽⁴²⁾

An attempt has been made in this paper to examine the growth and composition of livestock products across the states in India during 1994-95 to 2001-02. The study is based on secondary source of data. Though the composition of milk production by buffalo, cow and goat has not changed in India, but it has varied across the states in India during the period under study. Also, the cow milk composition by cross breed and non-descript has changed

across the states. Compared to eastern region states, the other region states have emerged as the growing states for egg production. Egg production by fowls is comparatively more than that by ducks. The eastern region states have produced more eggs by fowls compared to the other region states. But in case of wool, the northern region states (i.e., Rajasthan and Jammu and Kashmir) have produced more than 50 percent of the total wool production. Inter state disparity of milk has risen over time while the reverse has occurred in case of egg and wool. But the disparity of wool has been relatively more than that of egg and milk. The growth rates have varied across the states during the period under study. Area under fodder crops, area under permanent pastures and other grazing land and fodder production are the determining factors in explaining inter-states (regional) variation of the livestock products, namely, milk and wool in India. The coefficients are positive and statistically significant. But these are negative and not statistically significant in case of egg. Thus milk and wool production depends on land and agricultural production while egg production is of land-saving and labour and capital intensive in nature. Hence egg is produced commercially in the context of diversification.

GANGWAR L.S., KUMAR SANDEEP AND BHARTI D.K.,

(43)

The result showed that with rapid economic growth, particularly, if accompanied by significant reduction in poverty,

future demand for milk, milk products, eggs and meats would escalate. This in turn requires changes in livestock production methods, with greater use of cereals in poultry and livestock feed. India has a marginal presence in the world trade of livestock products. Meat and meat product is the main livestock product of export, accounting for over 90 per cent to the total export earning from the livestock sector. Most of Indian livestock products do not conform to the international standards of account of sanitary and phyto-sanitary restrictions, sub-standard processing, packaging and lack of cold chains for transportation as per specifications. If India would like to sustain its position in the international market, all these constraints must be borne in mind and we should strive to meet the international quality norms for livestock sector. The robust growth in the livestock sector in recent years indicates that if managed properly, livestock could be driving force for the growth of agricultural sector in future decades. Apart from its immense and rising contributions to agricultural gross domestic product, food and nutrition security, livestock has the capacity to be reduced interpersonal and inter-regional economic disparity, as there exists considerable scope to enhance the income and employment opportunity.

NAVADKAR D.S., JOSHI G.G., SHETE V.R. AND
NAVALE S.K. ⁽⁴⁴⁾

It was observed that the cost of maintenance per broiler declined with an increase in the size of broiler units. Winter season was the best for production of broilers to a large extent in terms of live weight of broiler, feed conversion ratio and marketed age. The sample broiler units were found to be profitable. The net profit per broiler showed an increasing trend with an increase in the size of the broiler unit. The average number of broilers maintained by the sample broiler units was over and above the optimum level indicated by the break-even points. The problems faced by the broiler rearers were high cost of feed followed by the cost of one-day-old chick, non-availability of credit in time, non-availability of labour, non-co-operation among producers and low price of final produce, etc. The study suggested that the broiler rearers should stabilize producers co-operative society at the tehsil level, in order to provide infrastructure faculty such as timely supply of chick, proper marketing faculties, technical know-how and credit faculties to the broiler producer. The feed manufacturing activity through co-operative society may be initiated so as to reduce cost of feed and facilitate timely availability of feed to broiler the rearers. Short-term poultry training courses for broiler producers have to be organizing at the tehsil level in convenience of the broiler rearers.

PANDEY U.K., SUHAG U.S., GOYAL S.K. AND
MANOCHA VEENA ⁽⁴⁵⁾

Based on secondary data the study examines the spatio-temporal changes in the pace of growth and stocking patterns and major contributions of bovines and ovine in India. All the states were grouped in to the northern, western, southern and eastern regions. Later on, the state wise bovines and ovine data for various census years such as 1972, 1977, 1982 and 1992 were compiled and added in accordance to the states and union territories of the respective regions so as to generate the region wise livestock population. The region wise inter census compound growth rates were computed for bovines and others to inter census periods such as 1972-77, 1977-82, 1982-87 and 1987-92. Based on these inter census compound growth rates, the bovine and small ruminants population was intra and extrapolated for the corresponding years so as to generate the continuous time-series data for the period 1972-2002. These data were also grouped into two periods, viz., 1972-1992 and 1972-2002 so as to fit the trend equation for various species. The findings of the study may be summarized as follows: (i) indigenous cattle were mainly reared by the farmers to sustain draught animal power and indigenous cow's milk had been considered as by-product. Furthermore, the eastern regions accounted for the highest concentration of these cattle followed by the western regions, (ii) Buffaloes were considered as the main

milch animal, followed by crossbreed cattle to sustain the milk production needs. Furthermore, western region accounted for the highest concentration of both buffaloes and crossbreed cattle in milk, followed by the northern region.(iii) A great majority of female bovines were dry and not calved which calls for the concern of animal scientists, planners and development manager. The farmers try to rear the offspring of these species for replacement and / or sales. Mechanization had affected the working bovine stock mainly on medium and large farms, (iv) India ranked first in the world in milk production and buffaloes contributed about 52 percent while cows contributed about 45 percent of the total milk production. Furthermore, the northern region had contributed the highest, followed by southern and western region in the total contribution of bovine's milk. The country has vast potential for export of dairy products provided we improve the quality of our milk products, (v) Sheep and goat and rearing activities though accorded positive growth across regions and at the all India level, yet regional disparity existed in it.

KUMAR SHALANDER, ⁽⁴⁶⁾

The study has also highlighted the housing systems of goats, labour utilization pattern feeding management and flock management of goats in different semi-arid zones. The comprehension of resources flows shows that the goat production system has strong linkages with other components of the farming

system and was largely dependent of the village system it shelf. The analysis further indicated that the family of goat keeper earned a net annual income of Rs. 1,302 to Rs. 1873 per goat in different categories. The losses suffered by goat farmers shows that the scarcity of fodder and losses due to diseases were the major constraints in goat rearing. The paper also examines the various factors constraining productivity improvement and dissemination of goat technologies and suggested ways to overcome these constraints.

KUMAR VINOD, ⁽⁴⁷⁾

Cheap imports of livestock product are a matter of concern for the Indian livestock industry, particularly for millions of small, marginal and landless dairy farmers. India is committed to zero import duty for milk powders and comparatively low tariffs on other major dairy product such as butter, butter oil, cheese and fresh milk (fat contain more than 6 percent). Unlike major dairy producing countries, India does not have special agricultural safe guard provisions for livestock products. In contrast, the bound rates of tariff for dairy products in most of the developed counties are very high. The study indicated that after liberalization and W.T.O., export of livestock product like meat and meat preparation, cheese, butter, ghee, bovine meat, buffalo, chicken meat and eggs increase by a remarkable rate as compare to pre-liberalization period. India's

exports of livestock product can be increase if the production and trade-related distortions are brought down, if not eliminated. Since the direct influence of the government, enhancement of the competitiveness of Indian product can be done by bringing down the domestic prices, reducing cost, productivity and efficiency in production, processing, transport and marketing. The country, in the short-run, should try to promote export of livestock product to the neighboring countries where similar all lower quality standard exist. However, the long-term strategy must be in creating efficient institutional framework to comply with the SPS and TBT provisions so that the huge potential of future world market for livestock product can be harnessed with the removal of quantitative restrictions, it would be difficult for Indian product to compete with the highly subsidized milk products of the developed countries, even in the Indian market as the Indian dairy industries is already facing stiff competition because of heavy subsidies by the developed countries, the value added taxes on dairy industry in India have to be brought down to negligible levels.

KHODASKAR R.D., (48).

The purpose of this study, 20 farmers grouped marginal, small, medium, large size categories were selected randomly from the study area. The selected dairy farmers possessed 61 cross-bred cows, 34 cross-bred female calves, 3 cross-bred male calves, 12

bullocks and 1 buffalo in the reference year 2003-2004. Dairying was reported as a subsidiary occupation by 80 percent of the dairy farmers. On the average, 2 persons per family worked in the dairy enterprise. The average number of days they worked in dairying was 70 and 90 in the case of male and female adults respectively during the year. Considering the receipts from expenditure on dairy enterprise, the receipts of total milk, dung and sale of animal's expenditure like rope, veterinary care, etc. the total surplus of dairy farmers worked out to Rs. 15,82,996 during the study year. The data thus shows that the dairy enterprises profitable conditionally. With the production of green fodder round the year the irrigated dairy farmers can conduct dairying with cross-bred cows more profitably than the dry land cultivators or landless.

ASHOK K.R. AND SOMASUNDARAM G., (49)

The result indicated negative change in the size of livestock between 1993 and 2003 for all categories. The employment generation in the livestock sector in the small farm on an average was 4061 hours of work of per month of which 82 per cent was 4 family labours. Among the family labour, males contributed 44 per cent and females contributed 38 per cent and the rest by children. Functional analysis revealed that 41 per cent of the variation in the size of the livestock population was explained by the specified independent variables. The total inputs from livestock from sector to crop sector was Rs. 9,823.85 on an average, with farmyard manure

accounting 444 per cent. Similarly the total input from crop sector to livestock sector was Rs. 2,853 with straw accounting for 45 per cent of the value. The estimated backward linkage of crop sector or forward linkage of livestock sector was 0.37 and forward linkage of crop sector or backward linkage of livestock sector was 0.19. It means while the crop sector utilizes 37 per cent of the value of livestock sector, utilizes only 90 per cent of output from crop sector.

KOSHITA A.K., CHANDRAKAR M.R. AND LALWANI
N.R., (50)

Field level analysis revealed that the average acreage of 4.89 hectares among the member were 6.87 and 5.37 for milch and drought cattle whereas, non-members had 8.36 and 5.59 milch and drought cattle in the 3.75 hectares of crop acreage. The empirical result suggested that the competitive market price of milk should be given to members for enhancing the milk procurement, to run the dairy plant up to the break-even level; and producers' share can be increased by curtailing the axis market network of RDSSM, secondary functions such as cattle feed, fodder seed, medical and veterinary facilities should be strengthened and non-members get the membership of RDSSM/MPCSs for improvement in the status of dairy animals through availing the facilities provided by RDSSM.

RAMCHANDRAN T., (51)

The study revealed that dairy farming is an activity with great potential and has offered considerable scope for employment and income generation in Kanyakumari district, which is basically rural in nature. Dairy farming activities are concentrated through out the district. Lot of milk co-operative societies have been stabilized for promoting the welfare of people engaged in dairy farming. From the above analysis, it is inferred that, dairy farming gives employment opportunities in the form of collecting dung cleaning shade, watering and feeding animals, grazing and cutting grass, milking, sale of milk, processing of milk and marketing of milk and milk products to a large numbers of people in the villages of Kanyakumari district. Further, it is found that the income is generated in the form of sale of milk, manure and sale of cattle. It may be conclude that dairy constitutes the major proportion of the cattle population in the sample households. Cattle rearing occupy a pivotal place among women folk of the rural areas thus, dairy farming plays the main source of employment and income and generation in the study area.

ATIBUDHI H.N., (52)

This clearly shows that is a positive relationship between return over variable cost and net income with size of farm from the

analysis it can be concluded that broiler farming is a profitable proposition for the villages around Bhubaneswar city. The result of the study recommended that the policy makers give the required emphasis on broiler production in the rural areas around big cities, which can generate additional income and employment. The rural farmers as well as rural youths can be persuaded to take up broiler farming which is comparatively less technical and gives greater returns. Broiler farming can easily be popularized in the villages especially around big cities where there is continuous demand for the broiler meat through out the year.

TRIPATHI R.S., AJORE RAM AND LAL KHAJANCHI,

(53)

The study revealed that the average size of holding was 507 ha out of which 64.26 per cent area was sodic (alkali). These sodic soils have been brought under cultivation after reclamation with chemical amendment, namely, gypsum. Based on the quantity of gypsum applied for sodic soil reclamation, the selected farms were categorized into four levels of reclamation technology adopters, viz., very low (amendment applied <5.75 t/ha), low (5.75 to 9.50 t/ha), medium (9.50 to 13.25 t/ha) and high (>13.25 t/ha). Rice-wheat cropping pattern was followed exclusively on all the farms covering more than 90 per cent of the total cropped area, where to fodder crops, namely, sorghum in kharif and berseem in rabi season occupied 3.68 and 3.82 per cent of the cropped area, respectively.

Almost all the selected farms had 100 per cent irrigation facilities and 4-5 milch animals of good quality breed. The proportionate gross income earned from milk production showed a decreasing trend with the increase in the level of sodic soil reclamation technology adoption on the farms. It was mainly due to the fact that the performance of crop enterprises was better and contributed more to the farm income at higher levels of the reclamation technology adoption. As against this, the performance of milk production enterprises was remarkably better on lower level reclamation technology adopter farms where the farmers have to compensate their poor crop income by increased earning from the milk enterprises. A similar trend was noticed in case of contribution made by milk production to net farm income. The study concluded that, in general, milk production has made a visible impact on diversification of the farm economy at all the levels of sodic soil reclamation technology adoption, and more favorable, in particular, to those farms where crop enterprises were less supportive to the farm income because of low levels of the reclamation technology adoption.



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CHAPTER-3

Socio-Economic Profile of dairy

Household

CHAPTER-3

SOCIO-ECONOMIC PROFILE OF DAIRY HOUSEHOLD

In this chapter (Unit-3) has studied socio-Economic status of different category of co-operative dairy household and non- co-operative dairy household women. This chapter includes socio-economic profile, family size, family composition, sex ratio, occupational pattern and education of the family member, participation of male and female in various activities, participation of women in dairy enterprise in different category etc.

SOCIO- ECONOMIC PROFILE OF RURAL WOMEN: -

The table- 3: 1 show the socio-economic profile of rural women- about 71 per cent farm women belong to scheduled caste /scheduled tribe category. Majority of the sample respondents were illiterate (92%). The composition of weaker sections (SC/ST) in the sample was around 40per cent. The monthly average income of the families represented by the sample respondents was less than Rs. 2000. About 42 per cent farm women were dependent on farming and labour for their livelihood while for another 20 per cent the source of livelihood was farming along with animal husbandry and for the remaining 38 per cent were exclusively dependent on farming only.

Table- 3: 1 Social- Economic profile of Rural Women

Category	Rural women (%)
Literacy	69.61
SC/ ST	39.8
Monthly Income	
Less than Rs. 2000	69.1
Rs. 2000 to 3000	16.3
Rs. 2000 and above	14.6
Source of Livelihood	
Animal Husbandry	38.2
Farming +Animal	20.0
Husbandry	
Farming +Labour	41.8

FAMILY SIZE, COMPOSITION AND SEX RATIO: -

“Family size means-what is the size of family in different category, the family composition includes the number of male, female and children per family and the sex ratio means- number of female at 1000 males” as show in the table-3: 2 –

Table3:2, Family Size, Composition and Sex Ratio in idfferent Category of Co-operative & non- cooperative Dairy household

Co-operative Dairy Household										Non-cooperative Dairy Household						
Category of Farmer	Family Size	Adult		Children		* Sex Ratio	Family Size	Adult		Children		* Sex Ratio	* * Sex Ratio			
		Male	Female	Male	Female			Male	Female	Male	Female					
Marginal farmer	4.9 [100.00]	1.33 [27.21]	1.2 [24.48]	1.23 [25.17]	1.13 [23.14]	909.09	5.05 [100.00]	1.57 [31.00]	1.38 [27.27]	1.1 [21.92]	1 [19.81]	908.16	908.57			
Small farmer	5 [100.00]	1.2 [24.00]	1.07 [21.33]	1.53 [30.67]	1.2 [24.00]	829.27	6.18 [100.00]	1.9 [30.88]	1.72 [27.94]	1.45 [23.52]	1.09 [17.66]	837.84	833.33			
Medium farmer	4.5 [100.00]	1.3 [28.00]	1.1 [24.44]	1.4 [31.11]	0.7 [16.45]	800	5.12 [100.00]	1.37 [26.83]	1.62 [31.71]	1.37 [26.83]	0.75 [14.63]	863.64	829.78			
Large farmer	6.4 [100.00]	1.8 [28.12]	2 [31.25]	1.6 [25.00]	1 [15.63]	882.35	5 [100.00]	1.75 [35.00]	1.25 [25.00]	1.25 [25.00]	0.75 [15.00]	666.67	793.1			
Overall Average	4.98 [100.00]	1.33 [26.75]	1.22 [24.41]	1.37 [27.42]	1.07 [21.42]	868.75	5.27 [100.00]	1.62 [30.70]	1.47 [27.85]	1.21 [23.10]	0.97 [18.35]	869.82	869.3			

* Sex Ratio No. of females at 1000 males.

** Grant total sex ratio

→ Figure in parenthesis indicate percentage

Family Size

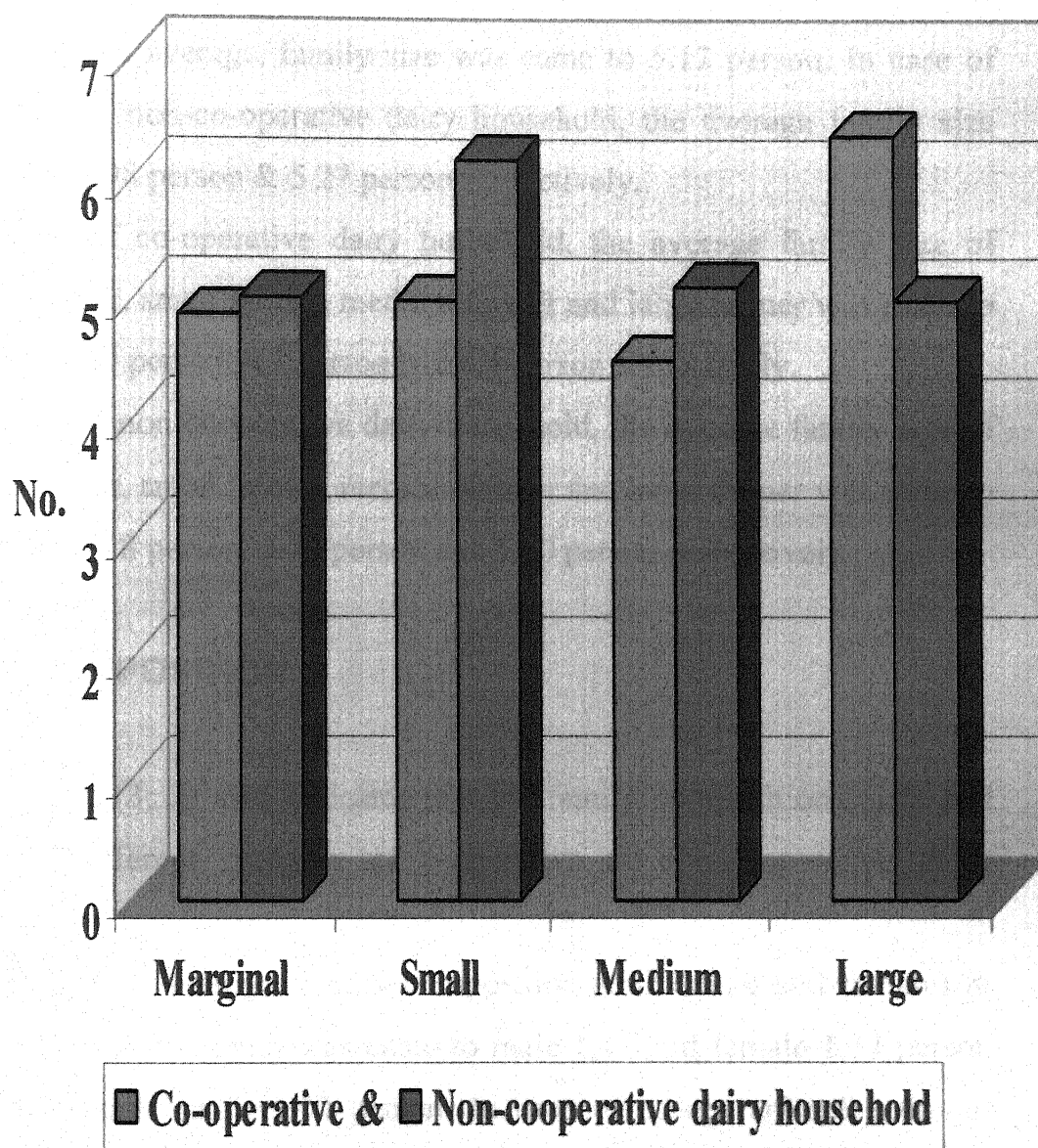


Figure-3: 1

SIZE OF FAMILY: -

The table-3: 2 specify that, the family size in different category of co-operative & non-cooperative dairy household

The overall average, family size was came to 5.12 person. In case of co-operative & non-co-operative dairy household, the average family size was came to 4.98 person & 5.27 person respectively.

In case of co-operative dairy household, the average family size of marginal farmer, small farmer, medium farmer and large farmer was came to 4.9 person, 5.00 person, 4.5 person and 6.4 person respectively.

In case of non-cooperative dairy household, the average family size of marginal farmer, small farmer, medium farmer and large farmer was came to 5.05 person, 6.18 person, 5.12 person and 5.00 person respectively.

FAMILY COMPOSITION: -

The table (3: 2) also indicates that the family composition (male and female) in different category of co-operative & non-cooperative dairy household

The overall average, family composition adult (male and female) & children (male and female) was came to male-1.47 and female-1.34 person & male-1.29 and female-1.02 person. In case of co-operative & non-co-operative dairy household, the average family composition (adult & children) was came to male-1.33 and female-1.22 person & male-1.62 and female-1.47 person respectively.

In case of co-operative dairy household, the average family composition (adult & children) of marginal farmer, small farmer, medium farmer and large farmer was came to male-1.33 and female-1.20 person, male-1.2 and female-1.07 person, male-1.3 and female-1.1 person and male-1.8 and female-2.00 person respectively.

In case of non-cooperative dairy household, the average family composition (adult & children) of marginal farmer, small farmer, medium farmer and large farmer was came to male-1.57 and female-1.38 person, male-1.9 and female-1.72 person, male-1.37 and female-1.62 person and male-1.75 and female-2.25 person respectively.

SEX RATIO: -

The table (3: 2) also specifies that the family sex ratio in different category of c-operative & non-cooperative dairy household.

The overall average, sex ratio was came to 854.98. In case of co-operative & non-co-operative dairy household, the average sex ratio was came to 868.75 & 869.82 respectively.

In case of co-operative dairy household, the average sex ratio of marginal farmer, small farmer, medium farmer and large farmer was came to 909.09, 829.27, 800.00 and 882.35 respectively.

In case of non-cooperative dairy household, the average sex ratio of marginal farmer, small farmer, medium farmer and large farmer was came to 908.16, 837.84, 863.64 and 666.67 respectively.

It can be conclude that average size of family was small in case of co-operative dairy household compare to non-cooperative dairy households.

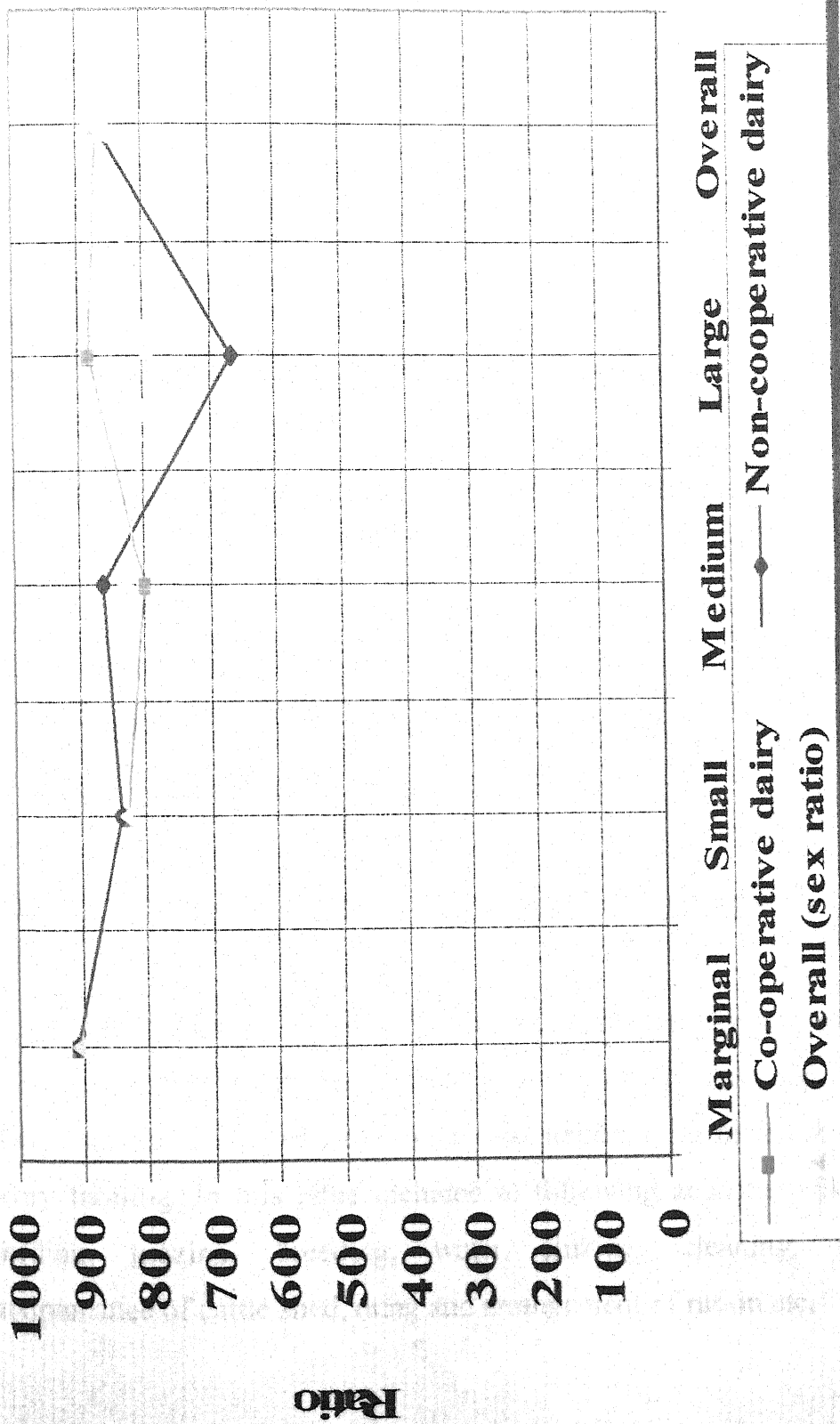


Figure-3:2

The sex ratio came to low in both case of co-operative & non-cooperative dairy household in compare to National sex ratio i.e. 933.

OTHER OCCUPATION OF RURAL WOMEN: -

The table 3: 3 show that 49 per cent of farm women were engaged in agriculture occupation, 27 per cent in agriculture along with labour 24 per cent were engaged exclusively as agriculture labour.

Table- 3: 3 Occupation Pattern of Rural Women

Occupation	Rural Women (%)
Only agriculture	49.1
Agriculture + agril. Labour	27.3
Agril. Labour	23.6

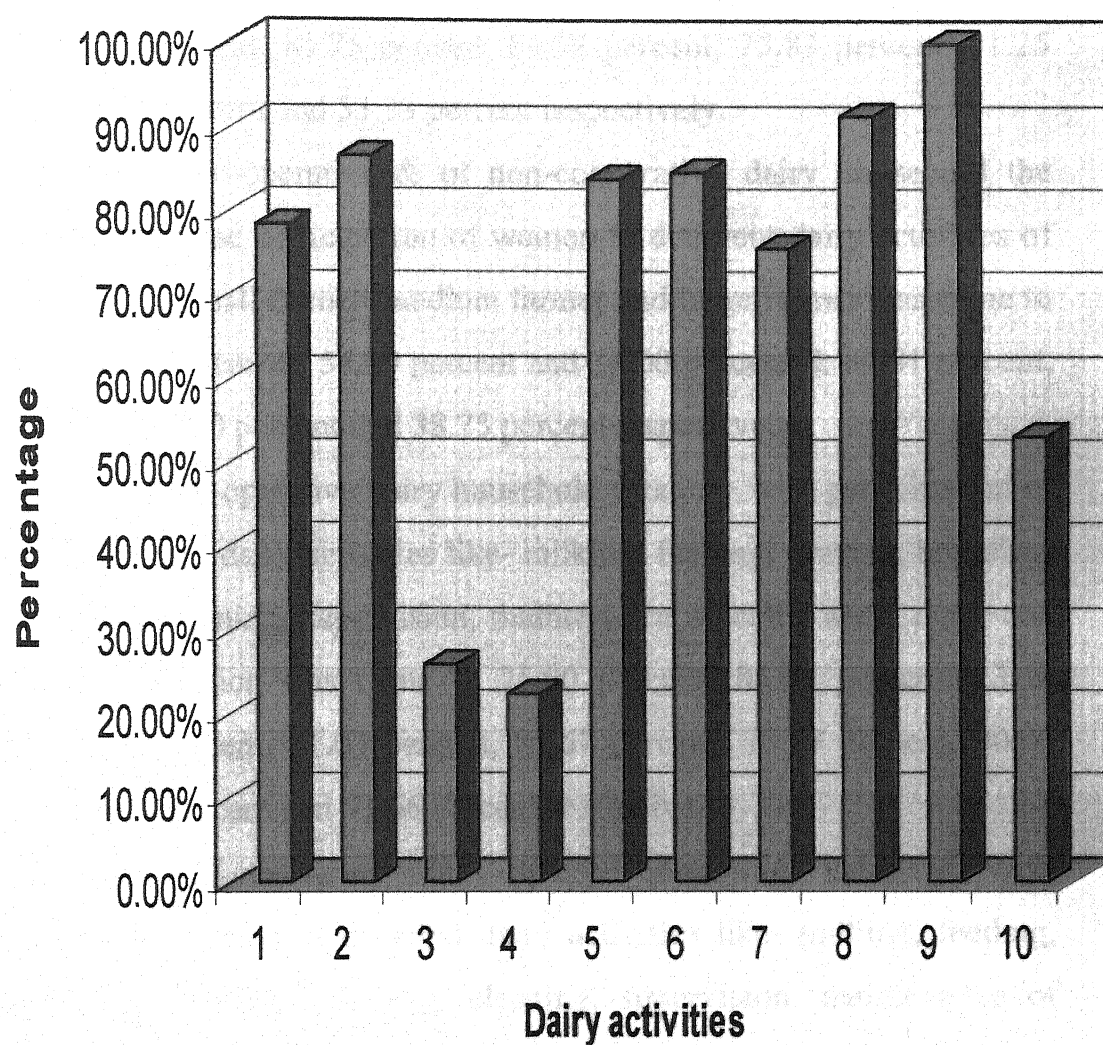
PARTICIPATION OF WOMEN IN DAIRY ACTIVITIES :-

Data presented in table 3: 4 reveals that participation of women in dairy enterprise in different category of co-operative & non-co-operative dairy household. The role of women was important in different activities of dairy farming. In this table included to following activities, like- milking, feeding, grazing, breeding, water dinking, cleaning, supervision, maintenance of cattle shed, dung and arrangement of ration etc.

Table - 3:4: Participation of Women, different activities in different Categories of Co-operative Dairy and Non-cooperative Dairy .

Operation	Co-operative Dairy					Non- Co-operative Dairy					Grant Total
	Marginal farmer	Small farmer	Medium farmer	Large farmer	Total farmer	Marginal farmer	Small farmer	Medium farmer	Large farmer	Total farmer	
Milking	93.33%	80%	40%	20%	75%	94.59%	81.82%	50.00%	25.00%	81.67%	78.33%
Feeding	96.67%	86.76%	70%	40%	85%	97.29%	81.81%	75.00%	50.00%	88.33%	86.67%
Grazing	40%	13.33%	-	-	23.33%	40.54%	18.18%	-	-	28.33%	25.83%
Breeding	36.67%	6.67%	-	-	20%	37.84%	9.09%	-	-	25.00%	22.50%
Water drinking	93.33%	86.67%	60%	40%	81.67%	97.29%	81.82%	62.50%	37.50%	85.83%	83.75%
Cleaning	90%	80%	80%	40%	81.67%	97.30%	72.72%	87.50%	37.50%	87.50%	84.58%
Supervision	83.33%	73.33%	70%	20%	73.33%	83.78%	72.72%	75.00%	50.00%	78.33%	75.83%
Maintenance of cattle shed	96.67%	93.33%	90%	40%	90%	100.00%	90.91%	87.50%	37.50%	92.50%	91.25%
Dung	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Arrangement of ration	60%	53.33%	30%	40%	51.66%	59.50%	54.54%	37.50%	50.00%	55.00%	53.33%
Total	79%	67.33%	54%	34%	68.17%	80.81%	66.36%	57.50%	38.75%	72.25%	70.21%

Participation of women in dairy activities



■ 1-Milking, 2-Feeding, 3-Grazing, 4-Breeding, 5-Water drinking, 6-Cleaning, 7-Supervision, 8-Maintenance of cattle shed, 9-Dung, 10-Arrangement of ration.

Figure-3: 3

According to table 3: 4, The overall category wise participation of women in different dairy activities like- milking, feeding, grazing, breeding, water dinking, cleaning, supervision, maintenance of cattle shed, dung and arrangement of ration was came to 78.33 percent, 86.67 percent, 25.83 percent, 22.50 percent, 83.75 percent, 84.58 percent, 75.83 percent, 91.25 percent, 100.00 percent and 53.33 percent respectively.

In case of co-operative & of non-cooperative dairy household the overall category wise participation of women in different dairy activities of marginal farmer, small farmer, medium farmer and large farmer was came to 79 percent, 67.33 percent, 54.00 percent and 34.00 percent & 80.81 percent, 66.36 percent, 57.50 percent and 38.75 percent respectively.

In case of co-operative dairy household category wise participation of women in different dairy activities like- milking, feeding, grazing, breeding, water dinking, cleaning, supervision, maintenance of cattle shed, dung and arrangement of ration was came to 75.00 percent, 85.00 percent, 23.33 percent, 20.00 percent, 81.67 percent, 81.67 percent, 73.33 percent, 90.00 percent, 100.00 percent and 51.66 percent respectively.

In case of non-cooperative dairy household category wise participation of women in different dairy activities like- milking, feeding, grazing, breeding, water dinking, cleaning, supervision, maintenance of cattle shed, dung and arrangement of ration was came to about 81.67 percent, 88.33 percent, 28.33 percent, 25.00 percent, 85.83 percent, 87.50 percent, 78.33 percent, 92.50 percent, 100.00 percent and 55.00 percent.

It can be conclude that, average participation of women in different dairy activities decrease with their farm size in both case of co-operative dairy household & non-cooperative dairy household.

Table-3:5,Participation of Male & Female working day in different Dairy activities

(Per Annum)

Operation	Adult		Children		Total	
	Male	Female	Male	Female	Male	Female
Taking animals for grazing	9 day	8 day	5 day	-	14 day	8 day
Bringing fodder from fields	2 day	6 day	1 day	1 day	3 day	7 day
Chaff cutting the fodder	2 day	5 day	1 day	-	3 day	5 day
Feeding of animals	1 day	6 day	1 day	1 day	2 day	7 day
Watering of animals	3 day	8 day	2 day		5 day	8 day
Cleaning of animals and sheds	2 day	2 day	2 day		4 day	2 day
Milking the animals	6 day	2 day		-	6 day	2 day
Making milk products	2 day	8 day	1 day	1 day	3 day	9 day
Sale of milk	13 day	8 day	2 day	-	15 day	8 day
Miscecllanesus workers (if any)	2 day	5 day	1 day	1 day	3 day	6 day
Total hours spent per-annum.	52 day	58 day	16 day	4 day	58 day	62 day

PARTICIPATION OF MALE AND FEMALE IN DAIRY ACTIVITIES: -

Often the workers in rural areas engage themselves in more than one activity. When the income from a particular source is low or uncertain, the rural workers resort to multiple activities. For instance, agriculture may be the principal activity for some persons who may also involve themselves in dairy farming, as subsidiary activities. It is because of the higher additional income generated from the dairy farm sector. Table 3: 5 show the "*Participation of male and female in dairy activities*" and working day per annum.

In table 3: 5 included following activities of dairy farming, like: - Taking animal for grazing, bringing fodder from fields, Chaff cutting the fodder, Feeding of animals, Watering of animals, Cleaning of animals and shed, Milking the animals, Making milk products, Sale of milk and Miscellaneous works etc.

The overall working day was came to (Adult) male 52 day and female 58 day, (Children) male 16 and female 4 day & (total) male 58 and female 62 day per annum.

The Participation of male and female in different dairy activities like- Taking animal for grazing male 14 day and female 44.13 day, bringing fodder from fields male 3 day and female 7 day, Chaff cutting the fodder male 3 day and female 5 day, Feeding of animals male 2 day and female 7 day, Watering of animals male 5 day and female 8 day, Cleaning of animals and shed male 4 day and female 2 day, Milking the animals male 6 day and female 2 day, Making milk products male 3 day and female 9 day, Sale of

milk male 15 day and female 8 day and Miscellaneous works was came to male 3 day and female 6 day working day per annum.

The result of the present study indicates the maximum working day was came to like making milk products followed by Taking animal for grazing, Watering of animals and Sale of milk.

PARTICIPATION IN FARM ACTIVITIES: -

It could be from results in Table-3: 6 that rural women participated in farm activities like manuring (100%), sowing (88.75%), weeding (98.75%), harvesting (100%), processing (96.25%), storing (51.255) and labour (62.5%). More or less similar results were reported by Chakravathy (1975), Dubey and Singh (1982) and Sherwani (1984). The participation in above activities was due to the culture of women, particularly in rural areas encourages them to perform all type of works without being influenced by situations, and the scarcity of men labour would be a probable reason for the same. With regard to time spent, the result of the present study indicates that maximum time was spent in weeding (236.46 hrs/year) followed by harvesting (132.31 hrs/year), sowing (75.04 hrs/year) and manuring (60.53 hrs/year).

Table- 3: 6, Participation of Rural Women in Farm Activities and time spent on them

S. No.	Activities	Percentage Participation	Average Time Spent per year (in hrs.)
1	Manu ring	100	60.53 (7.6)
2	Seed treatment	38.75	3.16 (0.4)
3	Sowing	97.5	75.04 (9.40)
4	Fertilizer application	17.5	6.63 (0.80)
5	Weeding	98.75	236.46 (29.5)
6	Watching the bird	27.5	17.09 (2.1)
7	Harvesting	100	132.31 (16.5)
8	Processing	96.25	52.56 (6.6)
9	Storing	62.5	35.47 (4.4)
	Total		619.05 (67.20)

PARTICIPATION OF RURAL WOMEN IN HOUSEHOLD ACTIVITIES: -

It is evident from Table-3: 7 that the overall participation of farm women in household activities was found to be more in case of cooking and serving food (100%). This was mainly because women whether rural or urban-based are considered primarily as homemakers. They have to perform other routine activities like fetching water (80%), caring children (80%), cleaning the house (92.5%), cleaning utensils (95%), washing clothes (92.5%) for which they are traditionally known for. The results are in conformity with the works of Venkatachalam (1983) and Gandhi et al. (1987). The Table also reveals that cooking and serving the food was the activity, which consumed major portion of the time of rural women. The total time spent is exceeding 365 days, which indicates that the general norms of 8 hours working day will not apply for domestic activities under our conditions.

Table- 3: 7 Participation of Rural Women in Household activities and time spent on them

S.No.	Activities	Percentage Participation	Average Time Spent per year (in hrs.)
1	Cooking and serving the food	100	1081.31 (135.2)
2	Fetching the food	80	315.21 (39.4)

3	Caring children	80	795.39 (99.5)
4	Cleaning the house	92.5	243 (30.4)
5	Cleaning utensils	95	290.12 (36.3)
6	Washing clothes	92.5	263.48 (32.9)
	Total		2988.51 (373.7)

THE LITERATE & ILLITERATE FAMILY MEMBER: -

The table 3:8, indicates the literate and illiterate family member in different category of co-operative and non-cooperative dairy household.

The overall average literate family member was come to male-2.01 (72.18 percent), female-1.65 (69.61 percent).

In case of co-operative dairy households, the literate male and female of marginal farmer, small farmer, medium farmer and large farmer came to male 1.88 (71.50 percent) and female 1.61 (69.00 percent), male 1.97 (72.33 percent) and female 1.59 (70.10 percent), male 1.98 (75.50 percent) and female 1.28 (71.00 percent) and male 2.57 (75.59 percent) and female 2.17 (72.50 percent) respectively.

In case of non-co-operative dairy household, literate male and female of marginal farmer, small farmer, medium farmer and large farmer came to

Table-3:8, Literate and illiterate family member per household in different category of co-operative & non- cooperative Dairy household.

Co-operative Dairy Household						
Category of Households	Total Literate		Literate		Illiterate	
	Male	Female	Male	Female	Male	Female
Marginal farmer	2.63 [100.00]	2.33 [100.00]	1.88 [71.50]	1.61 [69.00]	0.75 [28.50]	0.72 [31.00]
Small farmer	2.73 [100.00]	2.27 [100.00]	1.97 [72.33]	1.59 [70.10]	0.76 [27.67]	0.68 [29.9]
Medium farmer	2.7 [100.00]	1.8 [100.00]	1.98 [75.50]	1.28 [71.00]	0.72 [24.50]	0.52 [29.00]
Large farmer	3.4 [100.00]	3 [100.00]	2.57 [75.59]	2.17 [72.50]	0.83 [24.43]	0.83 [27.5]
All average	2.7 [100.00]	2.28 [100.00]	1.98 [73.24]	1.59 [69.92]	0.72 [26.76]	0.69 [30.08]
Non-cooperative Dairy household						
Marginal farmer	2.67 [100.00]	2.38 [100.00]	1.87 [70.00]	1.64 [69.92]	0.8 [30.00]	0.74 [30.08]
Small farmer	3.35 [100.00]	2.81 [100.00]	2.39 [71.50]	1.94 [68.80]	0.96 [28.50]	0.87 [31.2]
Medium farmer	2.74 [100.00]	2.37 [100.00]	1.99 [72.61]	1.64 [69.00]	0.75 [27.39]	0.73 [31.00]
Large farmer	3 [100.00]	2 [100.00]	2.22 [74.00]	1.43 [71.40]	0.78 [26.00]	0.57 [28.6]
All average	2.88 [100.00]	2.44 [100.00]	2.05 [71.20]	1.7 [69.54]	0.83 [28.8]	0.74 [30.46]
Overall average	2.79 [100.00]	2.36 [100.00]	2.01 [72.18]	1.65 [69.61]	0.78 [27.82]	0.71 [30.39]

→ **Figure in parenthesis indicate percentage**

Education of the per family in different category

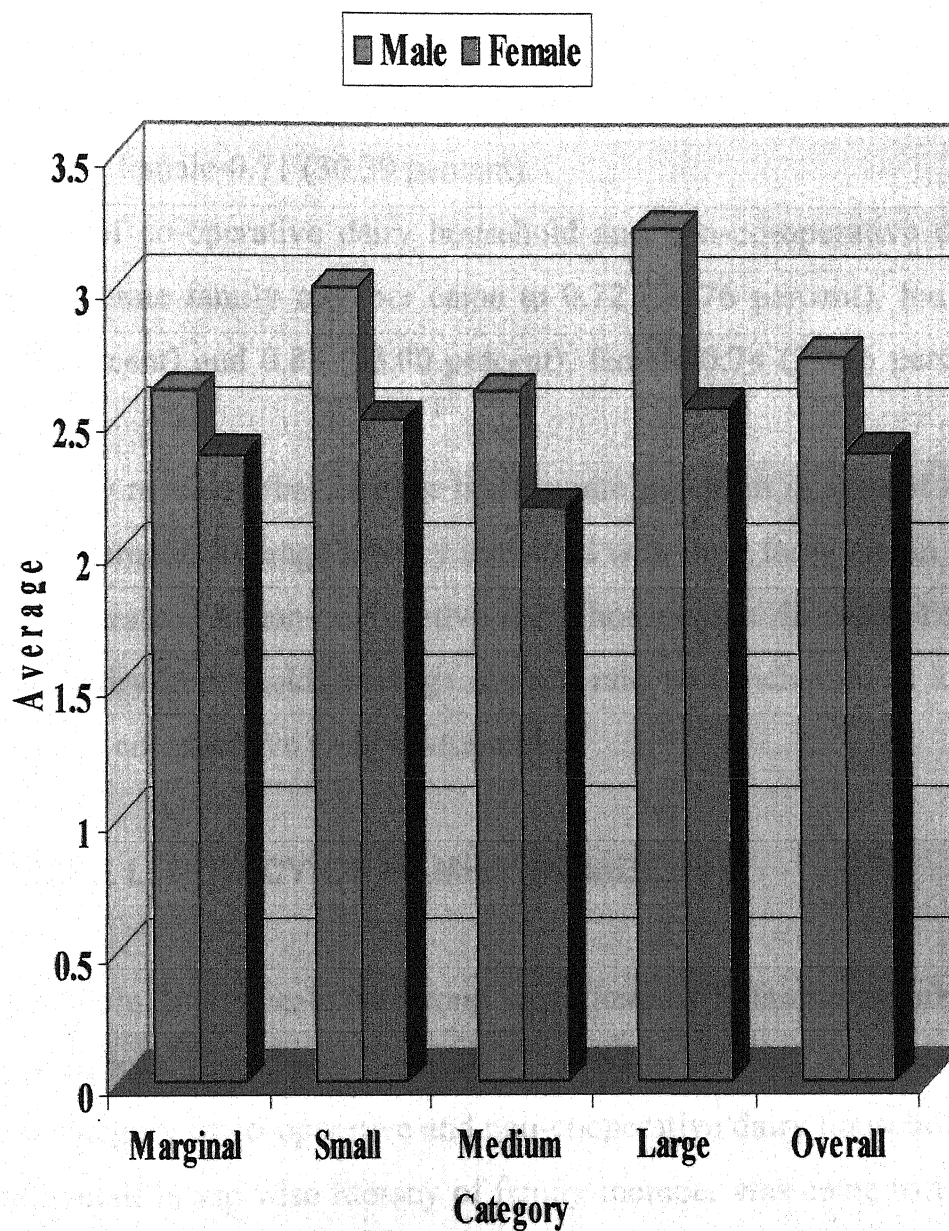


Figure-3: 4

male 1.87 (70.00 percent) and female 1.64 (69.92 percent), male 2.39 (71.50 percent) and female 1.94 (68.80 percent), male 1.99 (72.61 percent) and female 1.64 (69.00 percent) and male 2.22 (74.00 percent) and female 1.43 (71.40 percent) respectively.

The overall average illiterate family member was come to male-0.78 (27.82 percent), female-0.71 (30.39 percent).

In case of co-operative dairy household and non-co-operative dairy household, illiterate family member came to 0.72 (26.76 percent), female-0.69 (30.08 percent) and 0.83 (28.80 percent), female-0.74 (30.46 percent) respectively.

The study revealed that average literacy rate was high in case of male in compare to female. Average literacy increased with their farm size in both cases of co-operative & non-cooperative dairy households. In case of non-co-operative dairy households average literacy rate was increased at lower rate compare to co-operative dairy households.

GROUP WISE LITERACY OF FAMILY MEMBER: -

The table 3: 8 reveals the group wise literacy of family member it can be divided into three-group 1- Up to 5th, 2- 5th to 10th and 3- above 10th in different category of co-operative and non-cooperative dairy household.

The overall group wise literacy of family member was came to Up to 5th male 104.95 person (43.43 percent) and female 104.76 person (53.03 percent), 5th to 10th male 95.15 person (39.37 percent) and female 88.43 person (44.76 percent) and above 10th male 41.55 person (17.02 percent) and female 4.37 person (2.21 percent).

Table3:9, Group wise literacy of different family member.

Co-operative Dairy Household								
Category of Households	Total Literate		Up to Vth		VI to X		Above X	
	Male	Female	Male	Female	Male	Female	Male	Female
Marginal farmer	56.34 [100.00]	48.23 [100.00]	25.83 [45.85]	26.61 [55.18]	21.95 [38.96]	21.62 [44.82]	8.56 [15.19]	-
Small farmer	29.62 [100.00]	23.87 [100.00]	13.06 [44.08]	13.1 [54.88]	11.84 [39.97]	10.77 [45.12]	4.72 15.95	-
Medium farmer	19.84 [100.00]	12.78 [100.00]	7.89 [39.77]	6.1 [47.74]	7.98 [40.21]	5.78 [45.25]	3.97 [20.02]	0.9 [10.01]
Large farmer	12.85 [100.00]	10.87 [100.00]	3.73 [29.05]	4.77 [43.88]	5.25 [40.85]	4.99 [45.91]	3.87 [30.1]	1.11 [10.21]
Allaverage	118.65 [100.00]	95.75 [100.00]	50.51 [42.57]	50.58 [52.85]	47.02 [39.63]	43.16 [45.07]	37.07 [17.80]	2.01 [2.08]
Non-cooperative Dairy household								
Marginal farmer	56.07 [100.00]	49.12 [100.00]	25.89 [46.18]	27.53 [56.05]	21.76 [38.81]	21.59 [43.95]	8.42 [15.01]	-
Small farmer	35.93 [100.00]	29.08 [100.00]	16.5 [45.92]	16.03 [55.12]	14.05 [39.11]	13.05 [44.88]	5.38 [14.97]	-
Medium farmer	19.9 [100.00]	16.47 [100.00]	8.28 [41.64]	7.43 [45.14]	7.85 [39.45]	7.41 [45.01]	3.77 [18.91]	1.63 [9.85]
Large farmer	11.1 [100.00]	7.14 [100.00]	3.77 [34.00]	3.19 [44.78]	4.47 [40.25]	3.23 [45.21]	2.86 [25.75]	0.72 [10.01]
All average	123 [100.00]	101.81 [100.00]	54.44 [44.26]	54.18 [53.22]	48.13 [39.13]	45.28 [44.47]	20.43 [16.61]	2.35 [2.31]
Overall average	241.65 [100.00]	197.56 [100.00]	104.95 [43.43]	104.76 [53.03]	95.15 [39.37]	88.43 [44.76]	41.55 [17.02]	4.37 [2.21]

→ Figure in parenthesis indicate percentage

Group Wise Literacy of Male

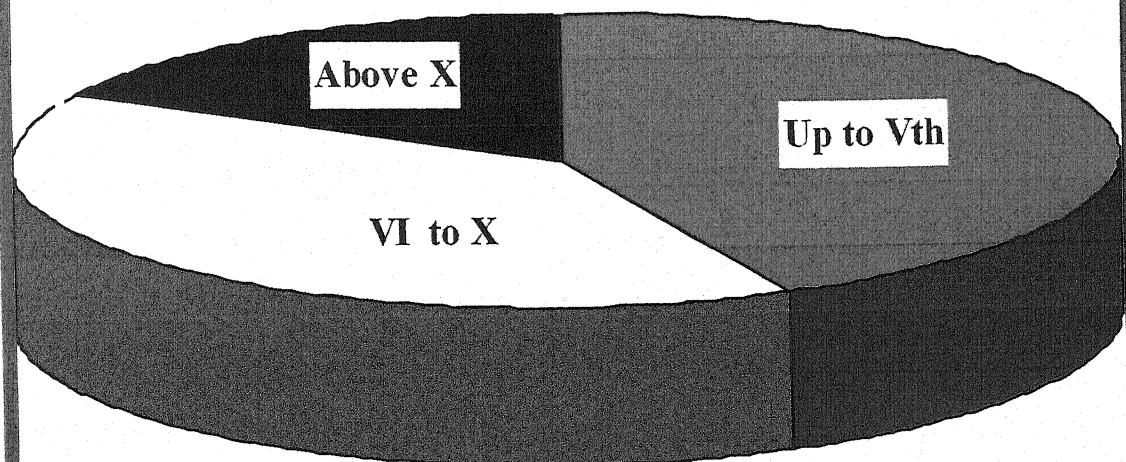


Figure-3:5

Group Wise Literacy of Female

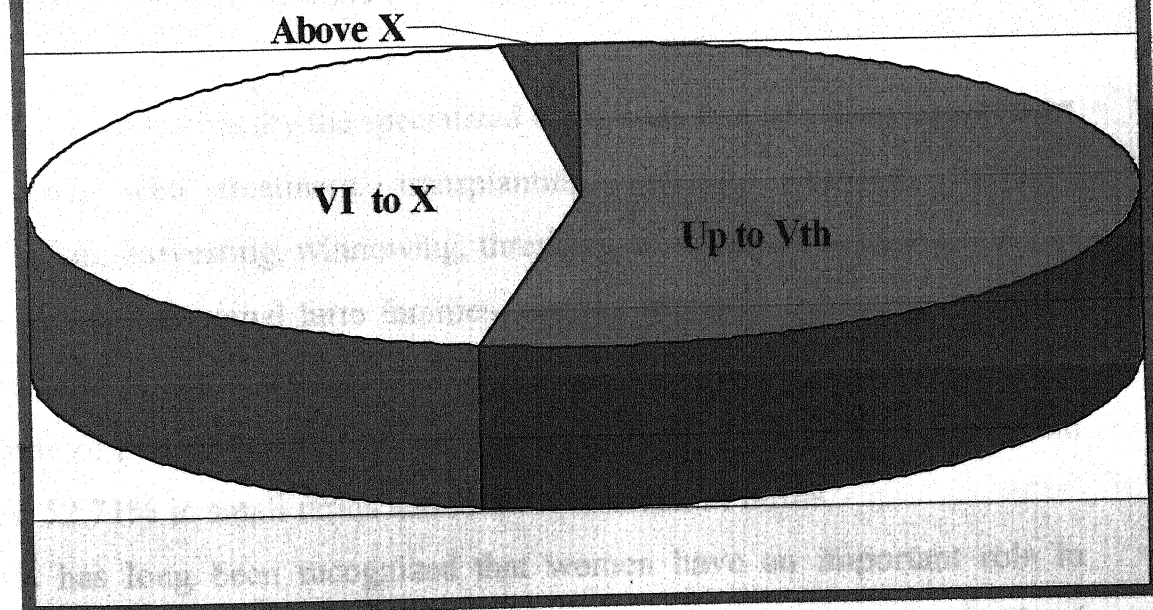


Figure-3:6

In case of co-operative dairy household, the group wise literacy of family member was came to Up to 5th male 50.51 person (42.57 percent) and female 50.58 person (52.85 percent), 5th to 10th male 47.02 person (39.63 percent) and female 43.15 person (45.07 percent) and above 10th male 21.12 person (17.80 percent) and female 2.01 person (2.08 percent).

In case of non- cooperative dairy household, the group wise literacy of family member was came to Up to 5th male 54.44 person (44.26 percent) and female 54.18 person (53.22 percent), 5th to 10th male 48.13 person (39.13 percent) and female 45.28 person (44.47 percent) and above 10th male 20.43 person (16.61 percent) and female 2.35 person (2.31 percent).

It can be concluded that, maximum literate family member was group 1st (Up to 5th) followed by group 2nd (5th to 10th) and group 3rd (above 10th). The women literacy percentage was low comparing to man.

WOMEN PARTICIPATION :-

In crop husbandry the specialized operations like selection and storage of seeds, seed treatment, transplanting, sowing, weeding, fertilizer application, harvesting, winnowing, threshing are carried out by women. In the small and marginal farm families, women engaged themselves in many of the farm operations either in their own field or others, as hired laborers. The rate of participation of women has been found to be 58.3% in marginal farms, 52.71% in small farms and 53.90% in medium farms.

It has long been recognized that women have an important role in livestock production, care and management and in the processing and sale of livestock production. In this sector, women's work includes collection of

fodder and water, cooking grains for cattle, preparation of concentrate feed for animals, feeding the animals, cleaning and washing cattle shed, cleaning and bathing animals, milking, preparation of milk products, taking the animals for roadside grazing, management and marketing of milk, collection of cow-dung, preparation of cow-dung cakes and their storage, and preparing manure for the farm. Though more than 95% of the work related to animal care is preformed by feminine gender, they do not own cows.

In fisheries sector women play an important role. Women living in fishing communities are very active from the moment the boats are landed in sorting and grading the catch, drying, smoking or curing the fish, making fish paste and taking the product to the local market. In addition, women are also responsible for performing the skilled time consuming jobs that take place onshore, such as net making and mending. Women constitute the bulk of marine food - processing work force, and play significant role in shrimp farming.

Also in many rural areas, migration of men and other changes in farming system are placing even greater burdens on women, who are left behind to manage agriculture and entire household alone. Despite tremendous contribution of rural women in the world economy, they continue to be overlooked, exploited and even further disadvantaged by many development processes. The world employment conference in June 1976 noted that women constitute the group at the bottom of the ladder in many developing countries in respect of employment; poverty; education, training and status.

World economic profile of women shows that they represent 50% of the population, make up 30% of the official labour force, perform 66% of all

working hours, receive 10% of world income and own even less than 1% of the world's property. Everywhere women as a group enjoy fewer advantages and work and opinions are undervalued. In many countries women earn less than men, and are prevented from owning land, face numerous obstacles to holding position of authority and face many threats of violence just because they are women.

It has been rightly observed that half of the women's work is unpaid and the other half is underpaid. There is no country where considerable differences are not found between the earnings of men and women and they have no control over their earnings.

In India although 87% of women are in agricultural industry only 36% of women have their own land the remaining work as agricultural labourers. In spite of women's preponderance in agricultural, it is estimated that only 5% of rural credit from multilateral banks ever reach women. Women's eligibility to receive technology and credit is questioned on the ground that they are not asset holders and do not have the status of a producer. Furthermore the existing loaning procedures are very cumbersome and prohibitive for women. In a nutshell women have access neither to agricultural information and services nor to production assets. Thus they suffer due to the limited access to the production resources.

Seasonal variation in agricultural timetable brings additional constraint and special problems for rural women. Women bear the brunt of hardship arising out of seasonal unemployment or under-employment.

Women's activity in production and marketing is strongly influenced by the stage of the family life cycle. The presence of small children inhibits women's labour availability and mobility unless they are

part of extended or multi-generation household. The lack of flexibility in terms of working hours, place and duration of work puts definite constraints on women of reproductive age. The lack of maternity care facilities also has negative impact on their productivity.

Women's efforts to expand the volume of their income generating activities are thwarted by their limited access to marketing facilities and services. Although women worldwide are active as traders, hawkers and street and market vendors little has been done to assist them with improved transport and maker facilities.

Rural women in developing countries have no clear legal status. Most critically, inheritance and tenure laws prohibit women's ownership and use of land. Even where women function effectively as heads of their household, they are often denied full legal status. Because men are the legally recognized landowners, it is they who provide the collateral. When they migrate to towns or cities leaving women to manage the household farm the problem is clearly compounded. Even extension services, c-operative and credit support are less available for women household heads than men.

Illiteracy is one of biggest curses, which leaves women handicapped. This is one of the foremost factors responsible for backwardness and poverty among women. A cost-benefit analysis carried out by the World Bank indicated that investment in the education of women has the highest rate of return of any possible type of investment in developing nations. Yet, precisely in those regions where hunger and malnutrition are most widespread, girls' access to education remains severely limited.

Furthermore, all agricultural services still have gender bias in favour of men. The group discussion meetings are usually held in villages involving

mostly men. Also, the venue and timing of such meeting are inconvenient for women and hence most needy are not able to attend, so is the case with training. While designing a training programme for women their dual rather triple burden of child rearing, farm work and household responsibilities is not given due consideration.

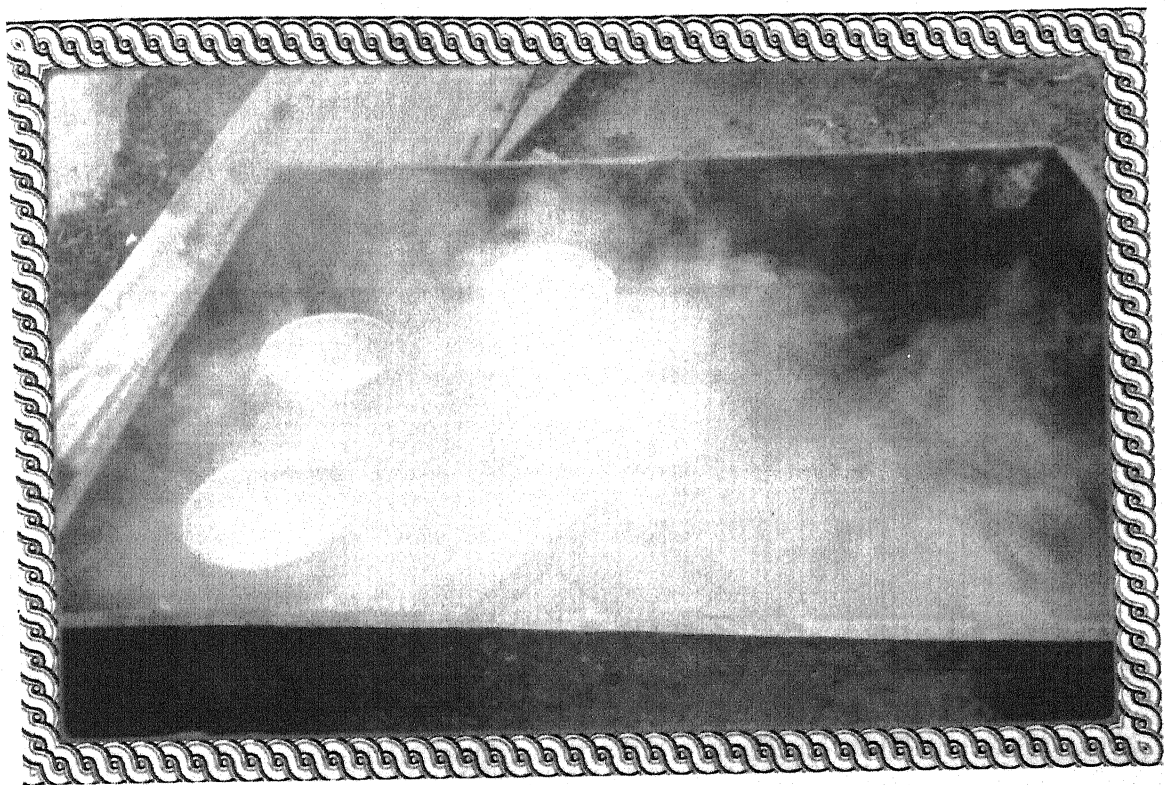
Though women often produce most of the food eaten in their homes, 7 out of 10 world's hungry are women and girls and in many countries are the victims of food discrimination. In parts of South Asia, despite the fact that women and older girls do most of the heavy work, men and boys consume twice as many calories. A study in India found that girls are 4 times as likely to suffer from acute malnutrition than boys, but 40 times less likely to be taken to a hospital in case of need. Only 20 to 40% of all women of childbearing age in the developing world receive the minimum caloric requirement for a healthy productive life.

The foregoing description clearly reveals the precious contribution made by women in food production and what they suffer in the process of 'feeding the world'.

Hunger and poverty are closely related household in poverty often depend disproportionately on women's incomes for survival, also research has shown that income in the hands of women has important benefits effects on family well-being because they spend the money on family's food, health and education. This is an important access of women to economic opportunities. The need to improve the economic status of women has been addressed and emphasized at several UN summits and conferences and action plans have been drawn with consensus of member countries yet no significant change has been achieved. Much more resources need to be

committed in the developing countries to enhance women's economic status, education, social services and health care.

National government need to make efforts in expanding women's economic opportunities, as farmers, wage earners and microenterpreneus, in improving women's access to land, money and information, in providing child-care services, labour-saving devices or technologies, training and agricultural extension, in improving wages and in providing better working conditions.



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CHAPTER-4

THE NATURE AND EXTENT OF DAIRY ENTERPRISE IN BUNDELKHAND REGION

In Bundelkhand Region, majority of farmer is Marginal and small engaged in dairy enterprise. Therefore, in this chapter study, the nature and extent of co-operative dairy milk enterprise by following tables - Infrastructure facilities, Economic category, Social category, Operational holding, Nature and extent of milch animal, Value of milch animal.

INFRASTRUCTURE FACILITIES: -

Table 4:1, reveals that infrastructure facilities in studied villages of Bundelkhand Region. The infrastructure facilities include Road, Transportation, Communication, and Education, Banking facility, nearest Railway station, Police station, Local Market, Hospital facility, Co-operative dairy, Mandi and Electricity supply.

Transportation facility included train, bus, tanga, auto etc. Communication facility included post office, telephone, and newspaper. Road facility included kuchcha, pucca. Education facility included; primary high schools, joiner high school, inter college and Degree College.

Table-4:1, Infrastructure facilities in the studied villages

		[In percentage]	
Approach of the village		Facility	
		Available	Not available
1. Village attached to	Kachcha road	25%	75%
	Puccha road	75%	25%
2. Transportation facility	Train	0%	100%
	Bus	75%	25%
	Tanga	75%	25%
	Auto	75%	25%
3. Education facility	Primary High School	75%	25%
	High School	75%	25%
	Inter College	25%	75%
	Degree College	0%	100%
4. Communication	Post Office	75%	25%
	Telephone	75%	25%
	News Paper	75%	25%
5. Banking facility		50%	50%
6. Co-operative Dairy		50%	50%
7. Nearest Railway station		50%	50%
8. Police station		75%	25%
9. Local Market		75%	25%
10. Hospital facility		50%	50%
11. Hat		50%	50%
12. Electricity supply		50%	50%

Table 4:1 indicate that only 3 villages were attached to pucca road and one village was not attached to pucca road.

Means of transportation were vary limited. Though bus, tanga and auto facility was available to three villages. While one village was facing the transportation facility.

Means of education facility were vary limited. Though primary high schools, joiner high school, inter college and Degree College. Education facility were available to three village and one village was not available followed by communication facility available to three village, and one village was not available, banking facility available to two village, and two village was not available, cooperative dairy, Hospital facility were available to two village and two village was not available.

Economic category: -

The table 4: 2: A, illustrate, the economic category of co-operative & non-cooperative dairy household according to land holdings.

“The economic categories show the land holding of the farmers.”

The farmers may be classified in the 4 categories according to their holdings. Viz. Marginal farmer ($0 < 1$ ha.), Small farmer (1-2 ha.), Medium farmer (3-4 ha.) and Large farmer ($4 >$ ha.).

In case of co-operative & non-cooperative dairy household, of marginal farmer, small farmer, medium farmer and large farmer was came to 50.00 percent, 25.00 percent, 16.67 percent and 8.33 percent respectively.

Table-4:2:A, Economic Category of Co-operative Dairy Household and Non-cooperative Dairy Household

Different Category of Household	Category of Household				
	Marginal farmer 0 < 1ha.	Small farmer 1-2 ha.	Medium farmer 3-4 ha.	Large farmer 4 > ha.	Total farmer
Co-operative Dairy Household	30 [50.00]	15 [25.00]	10 [16.67]	5 [8.33]	60 [100.00]
Non-cooperative Dairy Household	30 [50.00]	15 [25.00]	10 [16.67]	5 [8.33]	60 [100.00]
Overall Dairy Household	60 [50.00]	30 [25.00]	20 [16.67]	10 [8.33]	120 [100.00]

→ Figure in parenthesis indicate percentage

Economic Category of Dairy Enterprise

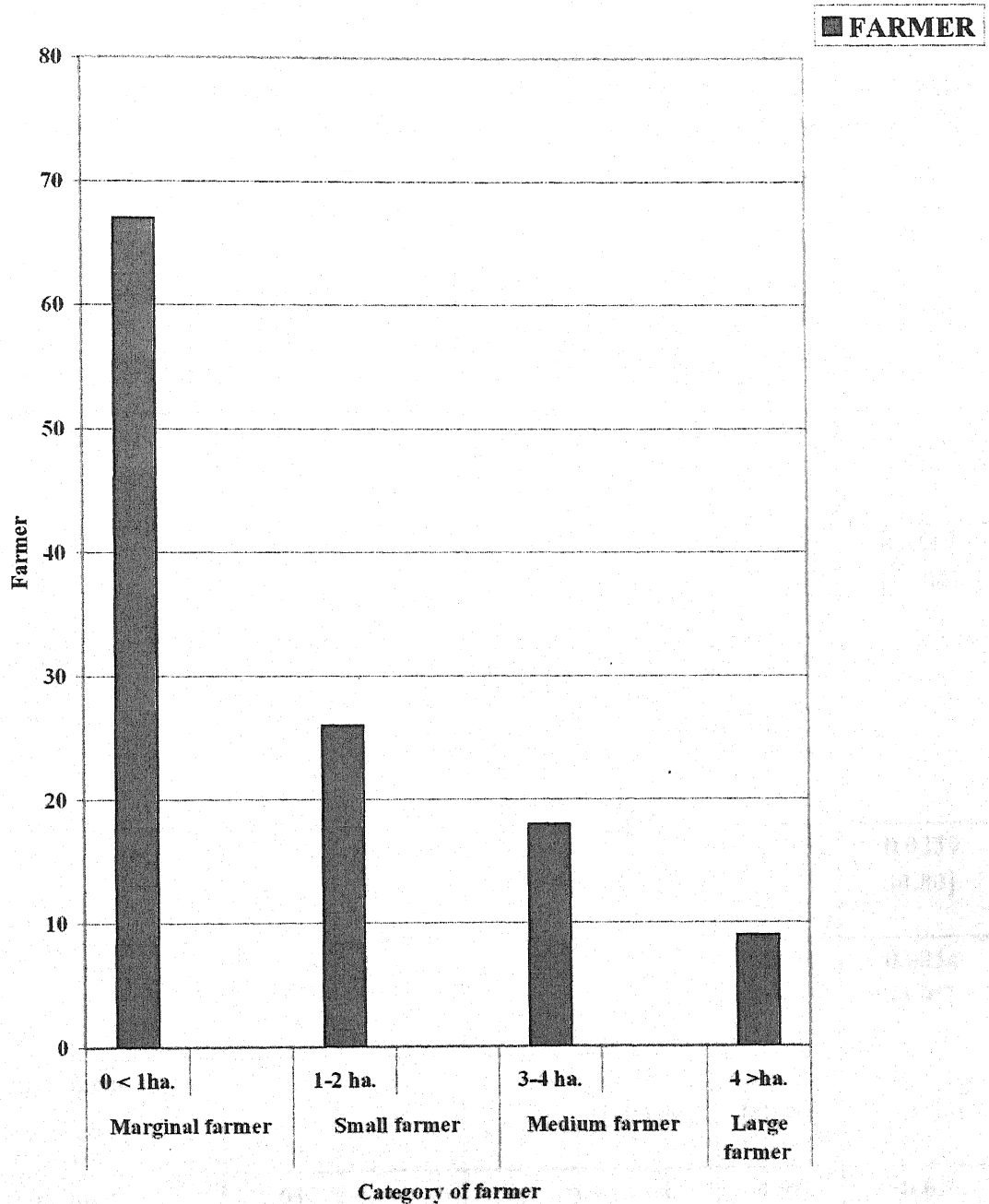


Figure-4:1: A

**Table 4:2:B, Operational Holding Per-family in Different Category of
Co-operative & Non-cooperative Dairy Household**

(In heceter)

Co-operative Dairy Household						
Category of Household	Area Owned	Area leased in	Area leased out	Total cultivated ed area	Total Irrigate area	Total Unirrigated area
Marginal farmer	0.6148	-	-	0.612 [100.00]	0.574 [93.79]	0.038 [6.21]
Small farmer	1.3982	-	-	1.3967 [100.00]	1.3264 [94.97]	0.0703 [5.03]
Medium farmer	3.1269	-	-	2.772 [100.00]	2.571 [92.81]	0.201 [7.19]
Large farmer	6.522	-	-	6.512 [100.00]	5.8608 [90.00]	0.6512 [10.00]
Overall farmer	1.7216	-	-	1.6598 [100.00]	1.5354 [92.50]	0.1244 [7.50]
Non-cooperative Dairy Household						
Marginal farmer	0.3735	0.1764	-	0.5394 [100.00]	0.5135 [95.20]	0.0259 [4.80]
Small farmer	1.5636	0.1636	-	1.7273 [100.00]	1.6418 [95.05]	0.0854 [4.95]
Medium farmer	2.7875	-	-	2.7875 [100.00]	2.4725 [88.70]	0.315 [11.30]
Large farmer	5.64	-	-	5.64 [100.00]	4.99 [88.47]	0.65 [11.53]
Overall farmer	1.2647	0.1387	-	1.397 [100.00]	1.28 [91.62]	0.117 [8.38]

→ **Figure in parenthesis indicate percentage**

Thus, majority of the farmer marginal farmers followed by small farmers both of farmers were 75 percent of the total no. of dairy household.

OPERATIONAL HOLDING: -

Operational holding means “all land which is used wholly or partly for agricultural production.” Table 4: 2: B, show the operational holding per family in different category of co-operative & non-cooperative dairy household according to land holdings. Operational holding included area owned, area leased in, area leased out, total cultivated area, total irrigate area and unirrigated area.

The table 4: 2: B, indicates that, In case of co-operative & non-cooperative dairy household, the all average area owned, cultivated area, irrigate area and unirrigate area was came to 1.7216 ha. and 1.2647 ha., 1.6598 ha. and 1.397 ha. 1.5354 ha. (92.50 percent) and 1.28 ha. (91.62 percent) and 0.1244 ha. (7.50 percent) and 0.117 ha. (8.38 percent).

In case of co-operative dairy household, the area owned of marginal farmer, small farmer, medium farmer and large farmer was came to 0.6148 ha, 1.3982 ha, 3.1269ha and 6.522 ha respectively.

In case of non-cooperative dairy household, the area owned of marginal farmer, small farmer, medium farmer and large farmer was came to 0.3735 ha, 1.5636 ha, 2.7875 ha and 5.64 ha respectively.

As a result that, the land holding increased in both cases of co-operative & non-cooperative dairy household with there farm size.

Table-4:3, Social Category wise Classification of Dairy Households

Category of Dairy Household	Gen.	OBC	SC/ST	Total
Marginal farmer	4 [6.66]	22 [36.67]	34 [56.67]	60 [100.00]
Small farmer	3 [10.00]	12 [40.00]	15 [50.00]	30 [100.00]
Medium farmer	3 [15.00]	10 [50.00]	7 [35.00]	20 [100.00]
Large farmer	3 [30.00]	7 [70.00]	- -	10 [100.00]
Overall	13 [10.83]	51 [42.50]	56 [46.67]	120 [100.00]

→ Figure in parenthesis indicate percentage

Social category of Dairy Enterprising

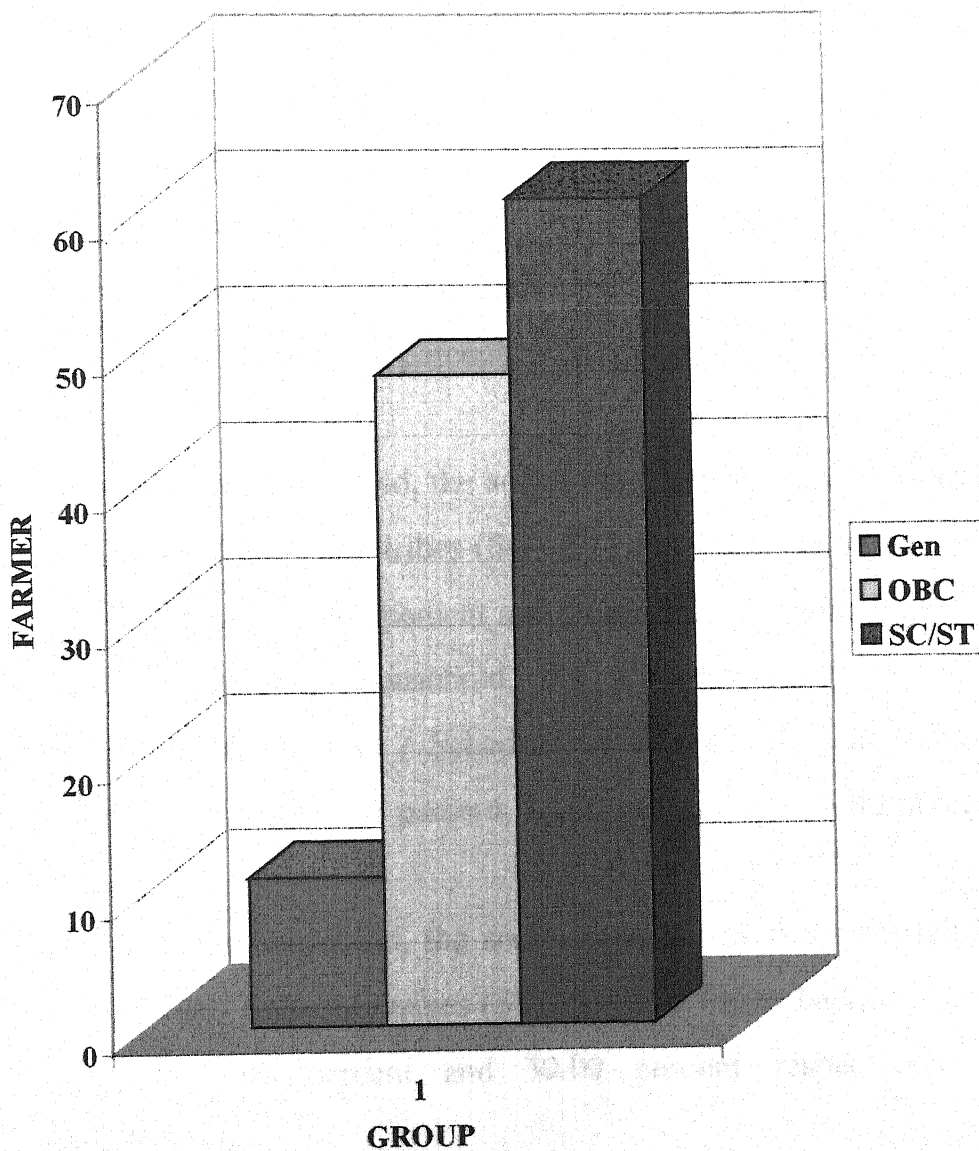


Figure-4:2

SOCIAL CATEGORY: -

In table 4: 3 revealed the social category of dairy household in Bundelkhand Region. The table revealed that, major part of dairy household was from Schedule cast / Schedule tribes (SC / ST) and Other backward who, as about 46.67 percent and 42.50 percent only 9.17 percent out of total dairy household were belong to general category.

In case of marginal household, the social category of dairy household from Schedule cast / Schedule tribes (SC / ST) and Other backward cast was came 56.67 percent, 36.67 percent and 6.66 percent respectively.

In case of small household, the social category of dairy household from Schedule cast / Schedule tribes (SC / ST) and Other backward cast was came 50.00 percent, 40.00 percent and 10.00 percent respectively.

In case of medium household, the social category of dairy household from Schedule cast / Schedule tribes (SC / ST) and Other backward cast was came 35.00 percent, 50.00 percent and 15.00 percent respectively.

In case of large household, the social category of dairy household from Schedule cast / Schedule tribes (SC / ST) and Other backward cast was came nil, 70.00 percent and 30.00 percent respectively in Bundelkhand Region.

It can be conclude that majority of the dairy household was belong to SC / ST followed by OBC and General.

Cropping Pattern

Cropes	Percentage	Hectare
1. Rice	1.00%	0.0153
2. Bajra	1.05%	0.016
3. Barley	1.51%	0.0231
4. Maiza	2.45%	0.0374
5. Jawer	2.36%	0.036
6. Wheat	30.61%	0.4678
7. Total Pulse	52.09%	0.7961
8. Oilseeds	7.07%	0.1083
9. Other	1.86%	0.0284

CROPPING PATTERN: -

The term cropping pattern means the allocation of cultivated area among the different crops grown by the farmer. It indicated the relative importance of different crops grown on the farms as show by the table 4:4.

The table 4: 4 indicates that the average total cropped area per farm 1.5284 hect. The table also indicates that in total pulses was came to the main crop having the average area of about 0.7961 hect and the next crop wheat 0.4678 hect, Oilseeds 0.1083 hect, Maiza 0.0374 hect, Barley 0.0231 hect, Bajra 0.0160 hect, Rise 0.0153 hect and last crop other cropped area about 0.0284 hect.

NATURE & EXTENT OF MILCH ANIMAL : -

Table 4: 5 show the nature and extent of milch animal per family in different category of co-operative & non-cooperative dairy household. In this table figure in parenthesis indicate percentage.

The overall average no. of milch animal came to 2.01. In case of co-operative dairy household, the number of buffalo and cow came to 1.55 (79.49 percent) and 0.4 (20.51 percent) respectively.

In case of non-co-operative dairy household, the number of buffalo and cow came to 1.51 (73.39 percent) and 0.55 (26.61 percent) respectively.

In case of co-operative dairy household, the no. of milch animal of marginal farmer, small farmer, medium farmer and large farmer was

Table-4:5, Nature & Extent of Milch Animal in Different Category of Co-operative Dairy Household and Non-cooperative Dairy Household

Category of Household	Buffalo [No.]	Cow [No.]	Total [No.]	Buffalo [No.]	Cow [No.]	Total [No.]	Grant total
Marginal farmer	1 [73.17]	0.37 [26.83]	1.37 [100.00]	1 [66.66]	0.5 [33.34]	1.5 [100.00]	1.43
Small farmer	1.93 [76.31]	0.6 [23.69]	2.53 [100.00]	1.93 [72.50]	0.7 [27.5]	2.67 [100.00]	2.6
Medium farmer	2 [86.96]	0.3 [13.04]	2.3 [100.00]	1.9 [82.61]	0.4 [17.33]	2.3 [100.00]	2.3
Large farmer	2.8 [93.33]	0.1 [6.67]	3 [100.00]	2.6 [81.23]	0.6 [18.77]	3.2 [100.00]	3.1
Overall	1.55 [79.49]	0.4 [20.51]	1.95 [100.00]	1.51 [73.39]	0.55 [26.61]	2.06 [100.00]	2.01

→ **Figure in parenthesis indicate percentage**

NATURE & EXTENT OF MILCH ANIMAL

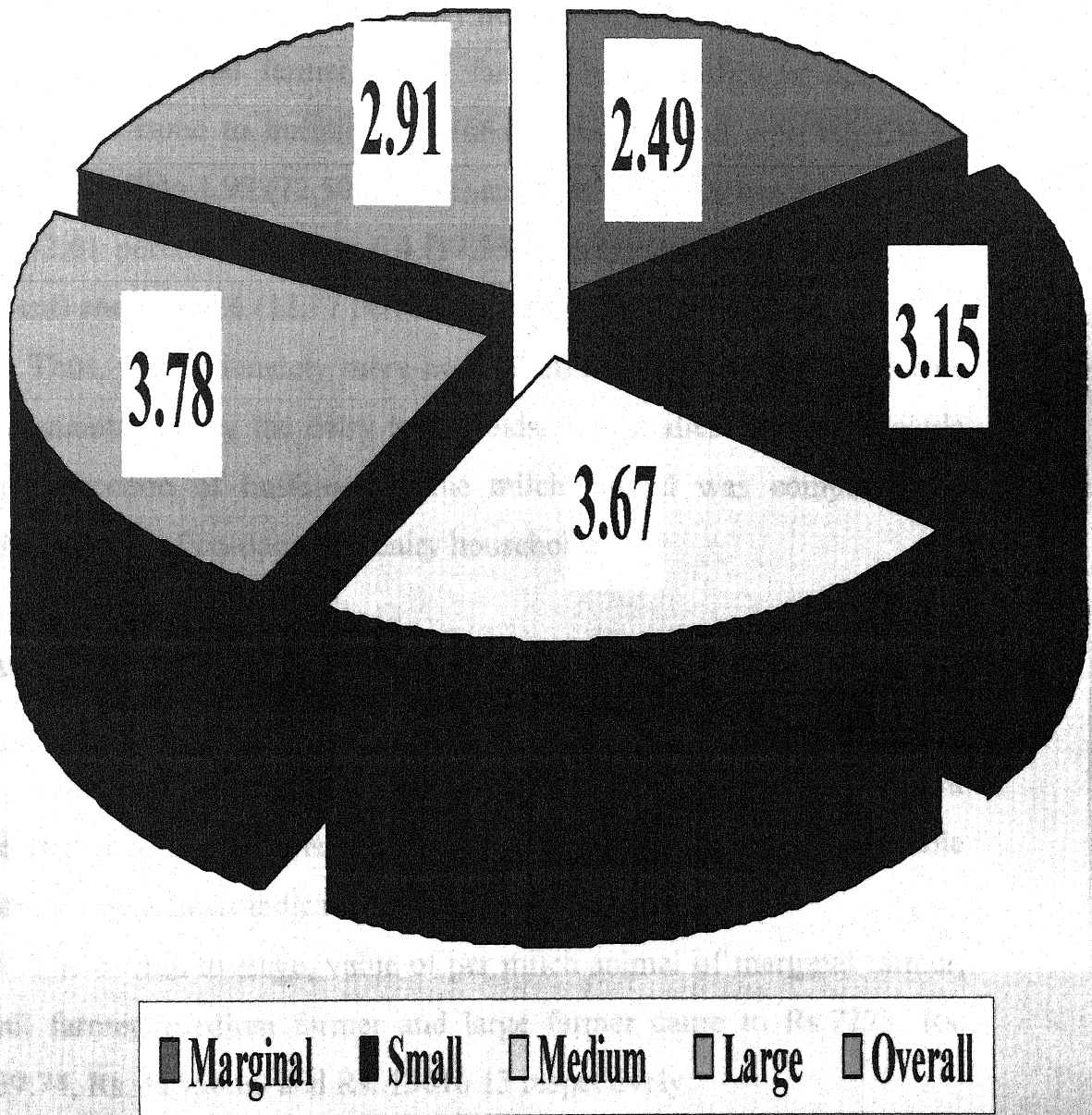


Figure-4:3

came to buffalo 1.00 (73.17 percent) and cow 0.37 (26.83 percent), buffalo 1.93 (76.31 percent) and cow 0.6 (23.69 percent), buffalo 2 (86.96) and cow 0.3 (13.04 percent) and buffalo 2.8 (93.33 percent) and cow 0.2 (6.67 percent) per milch animal per annum.

In case of non-cooperative dairy household, the average no. of milch animal of marginal farmer, small farmer, medium farmer and large farmer was came to buffalo 1.00 (66.66 percent) and cow 0.5 (33.34 percent), buffalo 1.93 (72.50 percent) and cow 0.7 (27.5 percent), buffalo 1.9 (82.61 percent) and cow 0.4 (17.33 percent) and buffalo 2.6 (81.23 percent) and cow 0.6 (18.77 percent) per milch animal per annum.

Thus, proportionately more no. of buffaloes in comparison to cow were maintained by the dairy households. The studies further conclude that proportion of buffaloes in the milch animal was comparatively higher in case of co-operative dairy households.

VALUE OF MILCH ANIMAL : -

Table 4: 6 demonstrate the value of per milch animal in different category of co-operative & non-cooperative dairy household. In this table figure in parenthesis indicate percentage.

The overall average, value of per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.7273, Rs. 9439.74, Rs. 12558.69 and Rs. 13016.13 respectively.

Table-4:6, Value of Milch Animal in Different Category of Co-operative Dairy Household and Non-cooperative Dairy Household

Category of Household	Co-operative Dairy Household			Non-cooperative Dairy Household			
	Buffalo [Rs.]	Cow [Rs.]	Average [Rs.]	Buffalo [Rs.]	Cow [Rs.]	Average [Rs.]	Overall average
Marginal farmer	10,000 [94.78]	1,500 [5.22]	7719.51 [100.00]	9,800 [95.14]	1,000 [4.86]	6,866.67 [100.00]	7,273
Small farmer	12,200 [95.16]	2,000 [4.84]	9,784.21 [100.00]	12,000 [95.47]	1,500 [4.53]	9,112.50 [100.00]	9,439.74
Medium farmer	14,810 [97.53]	2,500 [2.47]	13,204.35 [100.00]	14,000 [97.08]	2,000 [2.92]	11,913.04 [100.00]	12,558.69
Large farmer	15,000 [98.78]	2.6 [1.22]	14,173.33 [100.00]	14,200 [96.70]	2,100 [3.30]	11,931.25 [100.00]	13,016.13
Overall	12,473.12 [96.30]	1,858.33 [3.70]	10,295.73 [100.00]	12,006.59 [95.98]	1,387.88 [4.02]	9,180.64 [100.00]	9,721.99

→ Figure in parenthesis indicate percentage

Value of Milch Animal

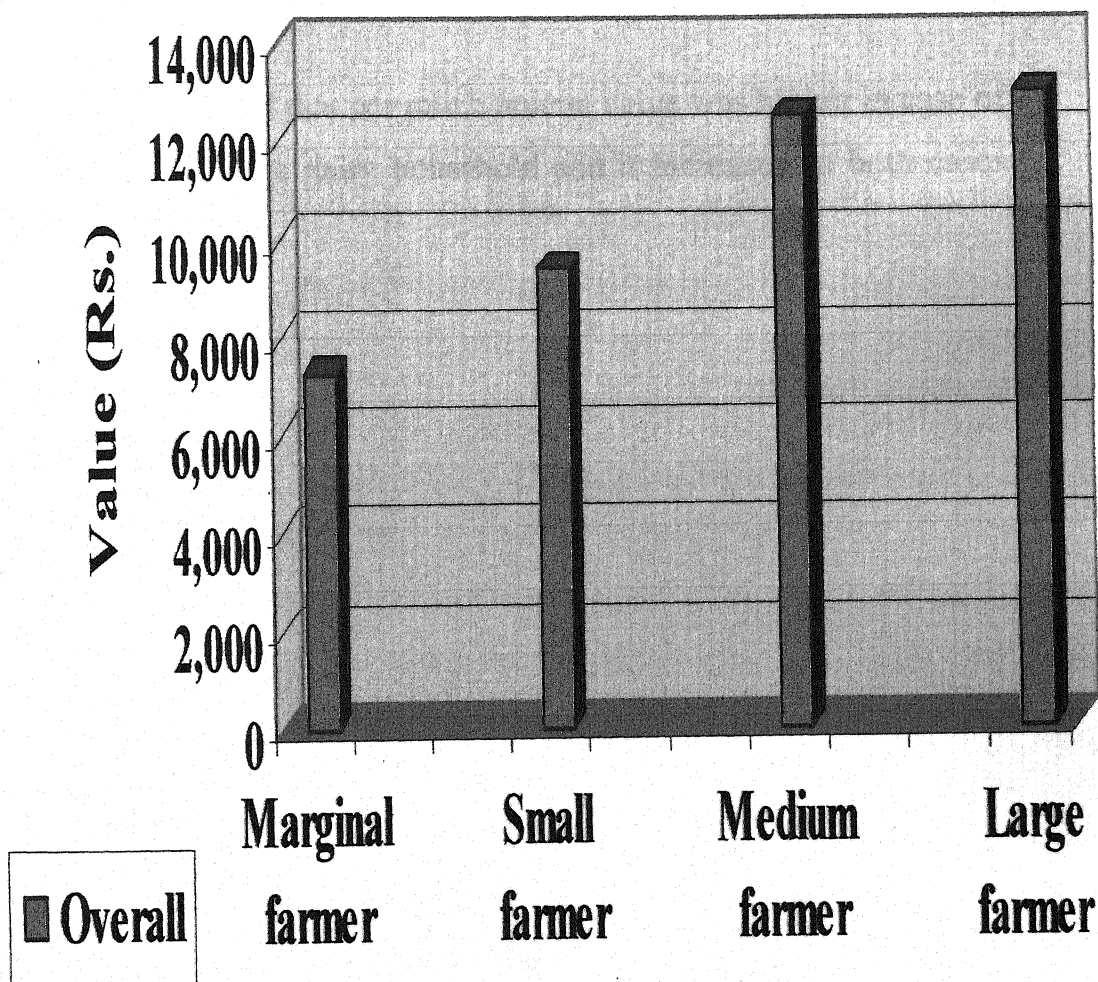


Figure-4:4

In case of co-operative dairy household, value of per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.7719.51, Rs. 9784.21, Rs. 13204.35 and Rs. 14173.33 respectively.

In case of non-co-operative dairy household, value of per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.6866.67, Rs.9112.5, Rs. 11913.04 and Rs. 11931.25 respectively.

The study revealed that per milch animal value was higher in case of co-operative cooperative dairy household and it increased in both cases with the size of holding.



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CHAPTER-5

Milk Production & Its Marketing

MILK PRODUCTION & ITS MARKETING

This chapter deals with the production of milk and its marketing in case of different category of household keeping milch animal. The production of milk and its marketing includes the following table as – Milk production, Season wise milk production, Milk Consumption and Marketed surplus, Cost of milk production, Dairy business incomes and channel wise milk marketing.

MILK PRODUCTION :-

PER MILCH ANIMAL :-

The table 5: 1 indicates the milk production *per milch animal*, per annum in different category of co-operative dairy household & non-co-operative dairy household. The all-average production of milk per milch animal came to 1423.78 liters in co-operative dairy household and 1246.68 liters per year of non-co-operative dairy household.

In case of co-operative dairy household, the production of milk per milch animal of marginal farmer, small farmer, medium farmer and large farmer was came to 1273.8 liters, 1365.1 liters, 1609.65 liters and 1697.25 liters per year respectively.

Table-5:1, Milk production per milch animal in different categories of co-operative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household	
Category of Households	Production of milk [In litres]
Marginal farmer	1273.8
Small farmer	1365.1
Medium farmer	1609.65
Large farmer	1697.25
All average	1423.78
Non-cooperative Dairy household	
Marginal farmer	1095
Small farmer	1135.15
Medium farmer	1500.15
Large farmer	1587.75
All average	1246.68
Overall average	1332.66

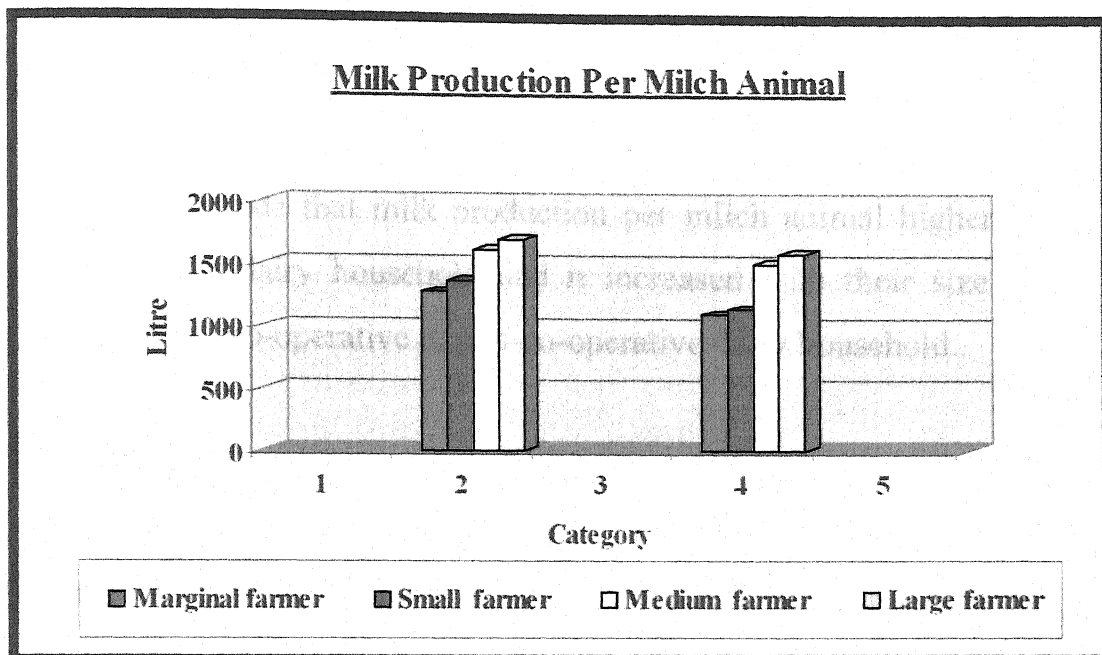


Figure-5: 1

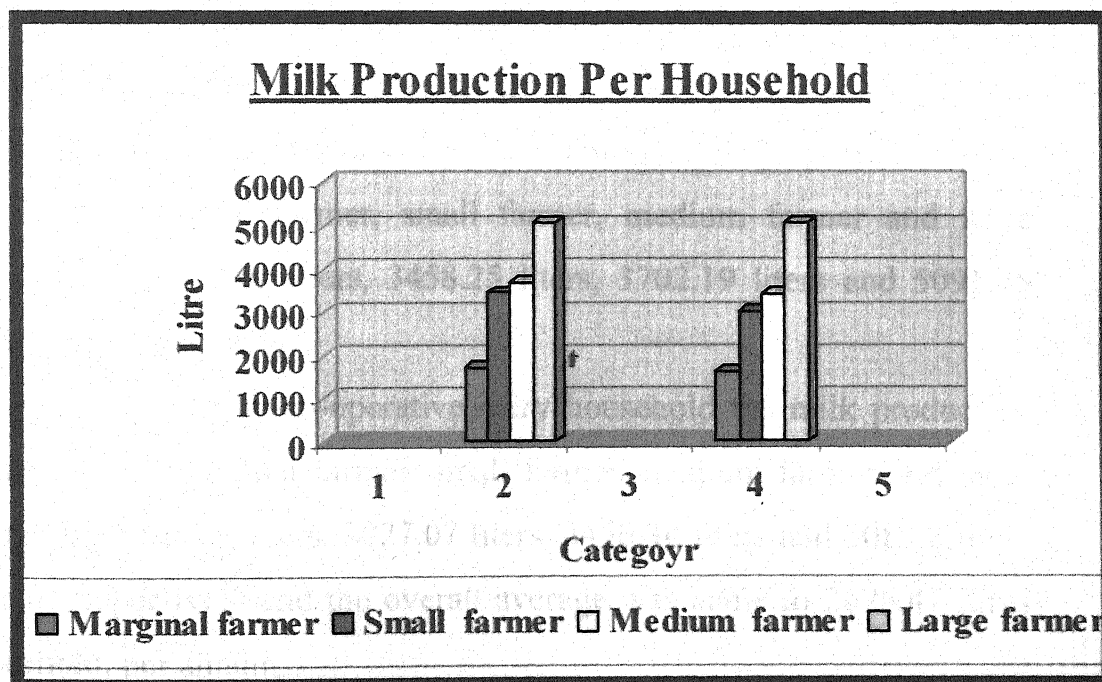


Figure-5:2

As In case of non-co-operative dairy household, the production of milk per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to 1095 liters, 1135.15 liters, 1500.15 liters and 1587.75 liters respectively and the overall average was came to 1332.66 litres per milch animal, per annum.

It can be conclude that milk production per milch animal higher in case of co-operative dairy household and it increased with their size of holdings in both case co-operative & non-co-operative dairy household..

PER HOUSEHOLD: -

The table 5: 2 explain milk production *per household*, per annum in different category of co-operative dairy household & non-co-operative dairy household. The all-average milk production per household was came to 2776.37 liters in co-operative dairy household and 2576.47 liters per year of non-co-operative dairy household respectively.

In case of co-operative dairy household the milk production per household of marginal farmer, small farmer, medium farmer and large farmer came to 1740.92 liters, 3458.25 liters, 3702.19 liters and 5091.75 liters per year respectively.

As In case of non-co-operative dairy household the milk production per household of marginal farmer, small farmer, medium farmer and large farmer came to 1642.5 liters, 3027.07 liters, 3450.34 liters and 5080.8 liters per annum respectively and the overall average was came to 2676.47 litres per household, per annum.

Table-5:2, Milk production per household in different categories of co-operative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household	
Category of Households	Production of milk [In litres]
Marginal farmer	1740.92
Small farmer	3458.25
Medium farmer	3702.19
Large farmer	5091.75
All average	2776.37
Non-cooperative Dairy household	
Marginal farmer	1642.5
Small farmer	3027.07
Medium farmer	3450.34
Large farmer	5080.8
All average	2576.47
Overall average	2676.42

It can be conclude that milk production per household increased with their size of holdings in both case and milk production of co-operative dairy household was higher in compare to non-cooperative dairy household.

Consumption of Milk Per Household at home: -

The table 5: 3 exhibits the milk consumption per family in different category of co-operative dairy household & non-co-operative dairy household, per day. The all average, milk production per family was came to 7.61 litres and milk consumption 2.57 liters (33.77 percent), per day of co-operative dairy household and as, milk production per family 7.06 litres and consumption 2.23 litres (31.59 percent), per day of non-co-operative dairy household.

In case of co-operative dairy household the milk production per family - marginal farmer, small farmer, medium farmer and large farmer was came to 4.76 liters, 9.47 liters, 10.14 liters and 13.95 liters per day and the milk consumption, about 1.76 litre (37.11 percent), 3.00 litre (31.68 percent), 3.14 litre (30.99 percent) and 4.95 litres (35.48 percent) per day of total milk production gradually.

In this way, non-co-operative dairy household, the milk production per family - marginal farmer, small farmer, medium farmer and large farmer was came to 4.50 liters, 8.29 liters, 9.45 liters and 13.92 liters per day and the milk consumption, about 1.50 litre (33.33 percent), 2.29 litre (27.62 percent), 3.00 litre (31.74 percent) and 4.92 litres (35.35 percent) per day of total milk production respectively.

Table-5:3, Milk production & consumption per household in different categories of cooperative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household		
Category of Households	Milk Production [Per day]	Milk Consumption at home [Per day]
Marginal farmer	4.76 [100.00]	1.76 [37.11]
Small farmer	9.47 [100.00]	3 [31.68]
Medium farmer	10.14 [100.00]	3.14 [30.97]
Large farmer	13.95 [100.00]	4.95 [35.48]
Allaverage	7.61 [100.00]	2.57 [33.77]
Non-Co-operative Dairy Household		
Marginal farmer	4.5 [100.00]	1.52 [33.33]
Small farmer	8.29 [100.00]	2.29 [27.62]
Medium farmer	9.45 [100.00]	3 [31.74]
Large farmer	13.92 [100.00]	4.92 [35.35]
All average	7.06 [100.00]	2.23 [31.59]
Overall average	7.33 [100.00]	2.4 [32.74]

~ Figure in parenthesis indicate percentage.

Milk Consumption & Marketed Surplus

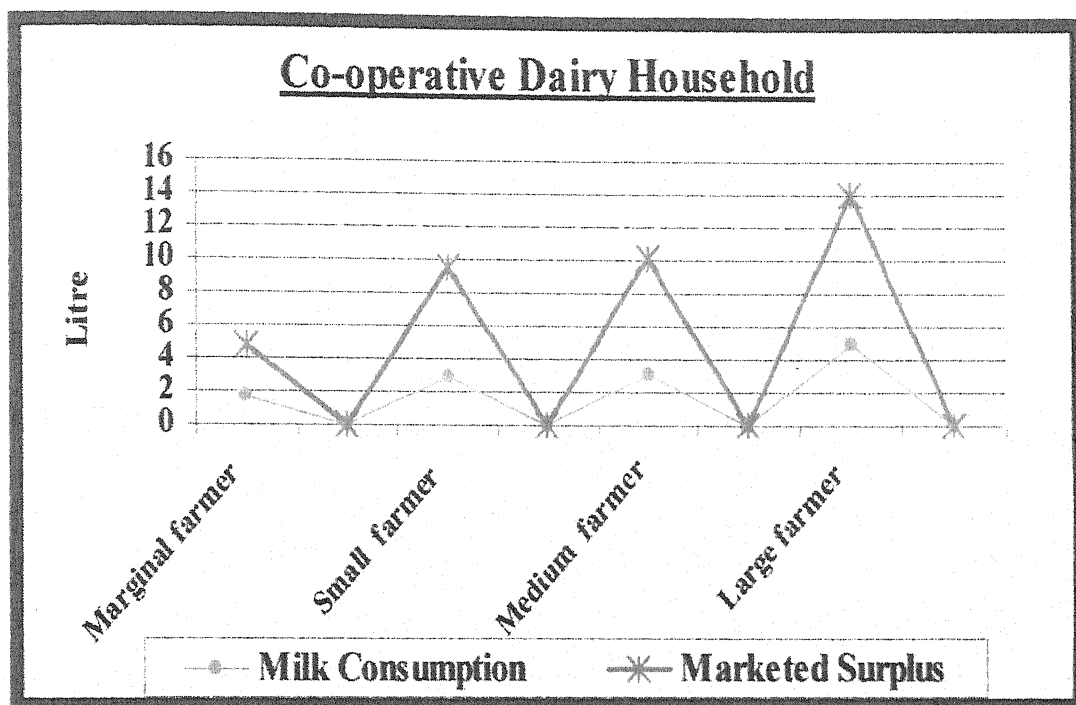


Figure-5:3

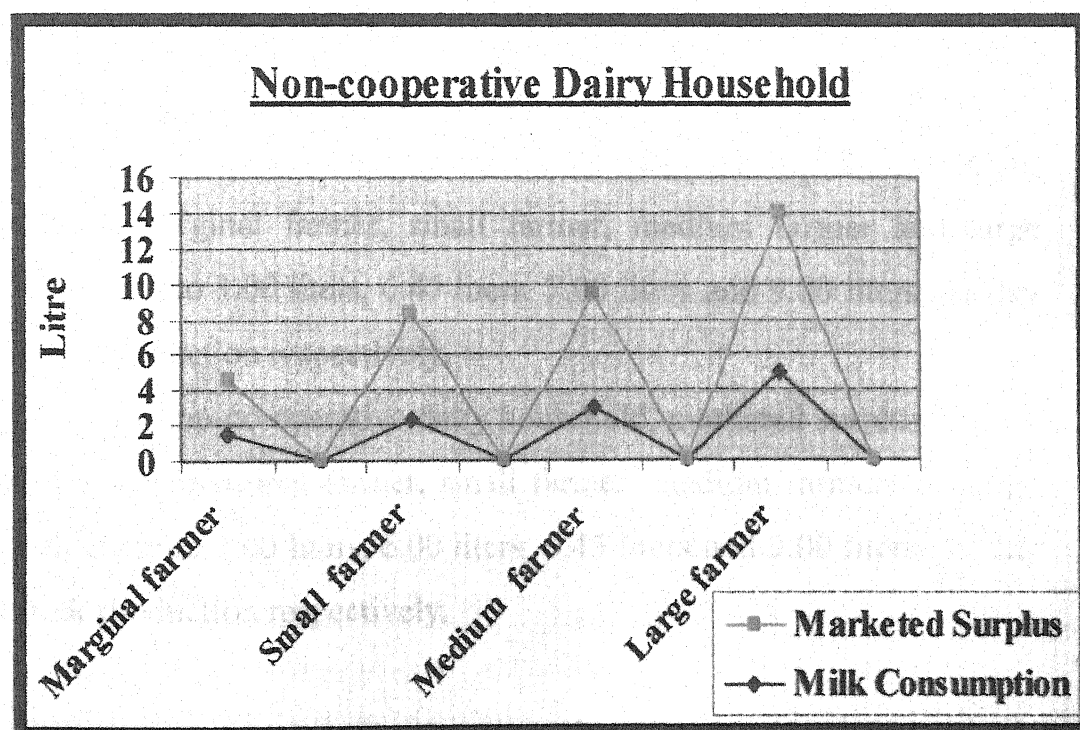


Figure-5:4

The overall average, milk production per family 7.33 litres per day and consumption of milk per family was come to 2.40 litres (32.74 percent) per day.

The study revealed that, the average milk production and consumption increased with their farm size in both cases co-operative & non-cooperative dairy household the average milk production and consumption and was higher in case of co-operative dairy household in compare to non-cooperative dairy household.

MARKETED SURPLUS OF MILK PER HOUSEHOLD: -

The table 5: 4 reveal that marketed surplus of milk production per household and per day in different category of co-operative dairy household & non-co-operative dairy household.

The analysis of data 5: 4 that all average, marketed surplus of milk per household was came to 5.04 litres of co-operative dairy household and 4.83 litres of non-co-operative dairy household per day.

In case of co-operative dairy household, marketed surplus of milk per household of marginal farmer, small farmer, medium farmer and large farmer was came to 3.00 liters, 6.47 liters, 7.00 liters and 9.00 liters per day of total milk production respectively.

In case of non-co-operative dairy household, marketed surplus of milk per household of marginal farmer, small farmer, medium farmer and large farmer was came to 3.00 liters, 6.00 liters, 6.45 liters and 9.00 liters per day of total milk production respectively.

TABLE-5:4, MILK PRODUCTION & SURPLUS PER HOUSEHOLD IN DIFFERENT CATEGORIES OF COOPERATIVE DAIRY & NON-COOPERATIVE DAIRY HOUSEHOLD (PER ANNUM).

Co-operative Dairy Household		
Category of Households	Milk Production [Per day]	Marketed Surplus [Per day]
Marginal farmer	4.76 [100.00]	3 [62.89]
Small farmer	9.47 [100.00]	6.47 [68.32]
Medium farmer	10.14 [100.00]	7 [69.03]
Large farmer	13.95 [100.00]	9 [64.52]
Allaverage	7.61 [100.00]	5.04 [66.23]
Non-Co-operative Dairy Household		
Marginal farmer	4.5 [100.00]	3 [66.67]
Small farmer	8.29 [100.00]	6 [72.38]
Medium farmer	9.45 [100.00]	6.45 [68.26]
Large farmer	13.92 [100.00]	9 [64.65]
Allaverage	7.06 [100.00]	[4.83] [68.41]
Overall average	7.33 [100.00]	4.93 [67.26]

~ Fiture in parenthesis indicate percentage.

The overall average, production of milk per family 7.33 litres per day and marketed surplus of milk per family was came to 4.93 litres (67.26percent) per day.

I can be concluding that, the marketed surplus of milk per family increased with farm size.

SEASON WISE MILK PRODUCTION: -

PER MILCH ANIMAL: -

The table 5: 5 demonstrate, season wise milk production *per milch animal* in different categories of co-operative dairy household and non-co-operative dairy household. This table, the point of view study divided season wise in three parts i. e. milk production Rainy season, winter season and summer season.

RAINY SEASON: -

The data explain that, all average milk production per milch animal was came to 440.23 liters per annum of co-operative dairy household and 387.72 liters per annum of non-co-operative dairy household, that is, about 30.92 percent and 31.10 percent in rainy season per annum.

In case of co-operative dairy household, the milk production per milch animal in rainy season of marginal farmer, small farmer, medium farmer and large farmer was came to 419.84 liters, 396.01liters, 482.7 liters and 510.36

Table-5: Seasonwise milk production per milch animal in different categories of co-operative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household				
Category of Households	Rainy Season (In litre)	Winter Season (In litre)	Summer Season (In litre)	Total milk Production (In litre)
Marginal farmer	419.84 [32.96]	554.74 [43.55]	299.21 [23.49]	1273.8 [100.00]
Small farmer	396.01 [29.01]	592.32 [43.39]	376.77 [27.60]	1365.1 [100.00]
Medium farmer	482.7 [30.00]	708.41 [44.01]	418.18 [25.99]	1609.65 [100.00]
Large farmer	510.36 [30.07]	731 [43.07]	455.88 [26.86]	1697.25 [100.00]
Allaverage	440.23 [30.92]	619.78 [43.53]	363.77 [25.55]	1423.78 [100.00]
Non-Co-operative Dairy Household				
Marginal farmer	339.45 [31.00]	418.8 [44.00]	273.75 [25.00]	1095 [100.00]
Small farmer	441.27 [33.05]	560.09 [41.95]	333.79 [25.00]	1335.15 [100.00]
Medium farmer	433.84 [28.92]	653.16 [43.54]	413.14 [27.54]	1500.15 [100.00]
Large farmer	489.82 [30.85]	679.4 [42.79]	418.93 [26.36]	1587.75 [100.00]
Allaverage	387.72 [31.10]	540.43 [43.35]	318.53 [25.55]	1246.68 [100.00]
Overall average	413.12 [31.00]	578.95 [43.44]	340.49 [25.56]	1332.66 [100.00]

~ Figure in parenthesis indicate percentage.

liters per annum, who, percentage of total milk production about 32.96 percent, 29.01 percent, 30.00 percent and 30.07 percent gradually.

In case of non-cooperative dairy household the milk production per milch animal in rainy season of marginal farmer, small farmer, medium farmer and large farmer came to 339.45 liters, 441.27 liters, 433.84 liters and 489.82 liters per annum, percentage of total milk production about 31.00 percent, 33.05 percent, 28.92 percent and 30.85 percent per annum.

The overall average, milk production per milch animal was came to 413.21 litres (31.00 percent) in rainy season.

WINTER SEASON: -

The data 5: 5 explain that, all average milk production per milch animal was came to 619.78 liters per annum of co-operative dairy household and 540.43 liters per annum of non-co-operative dairy household, about 43.53 percent and 43.35 percent in winter season respectively.

In case of co-operative dairy household, the milk production per milch animal in winter season of marginal farmer, small farmer, medium farmer and large farmer was came to 554.74 liters, 592.32 liters, 708.41 liters and 731.00 liters per annum, who percentage of total milk production about 43.55 percent, 43.39 percent, 44.01 percent and 43.07 percent gradually.

In case of non-cooperative dairy household, the milk production per milch animal in winter season of marginal farmer, small farmer, medium farmer and large farmer was came to 418.8 liters, 560.09 liters, 653.16 liters and 679.40 liters per annum, who percentage of total milk production about 44.00 percent, 41.95 percent, 43.54 percent and 42.79 percent per annum.

Seasonwise Milk Production (Per milch animal)

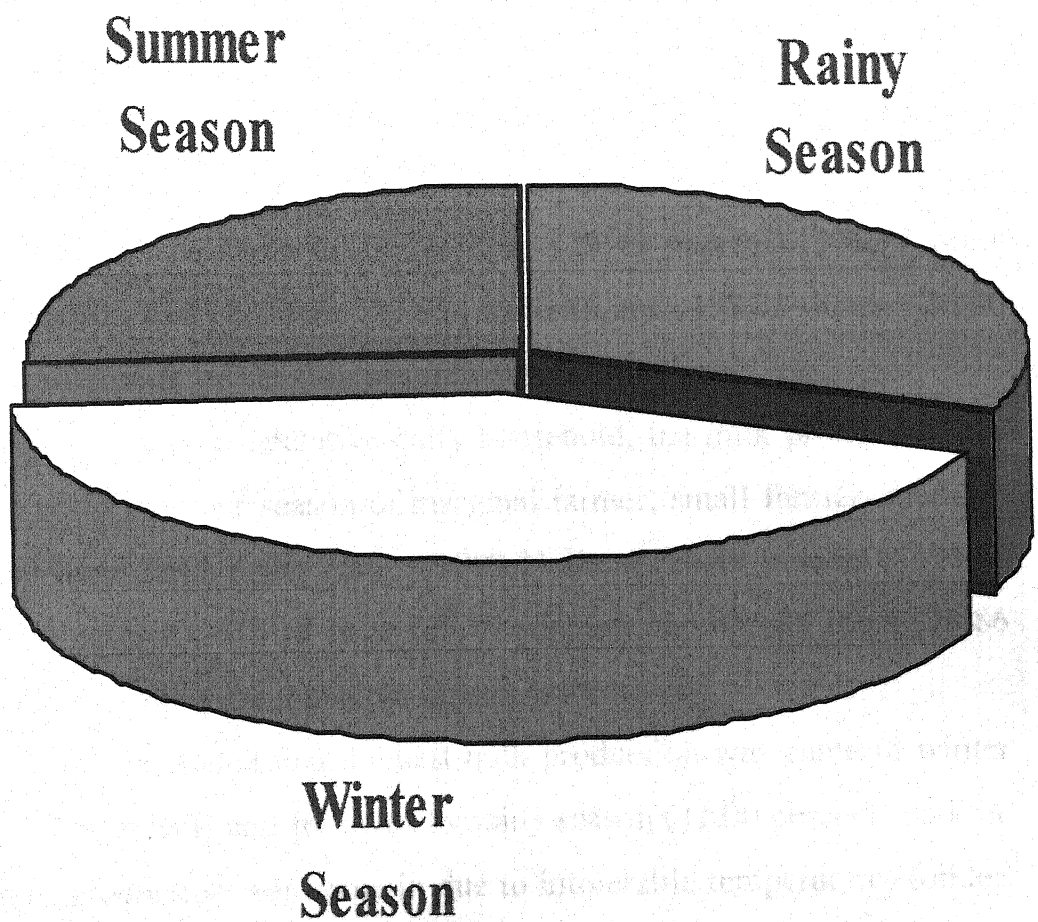


Figure-5:5

The overall average, milk production per milch animal was come to 578.95 litres (43.44 percent) in winter season per annum.

SUMMER SEASON: -

The table 5: 5 explain that, all average milk production per milch animal in summer season was came to 363.77 liters per annum of co-operative dairy household and 318.53 litres per annum of non-co-operative dairy household, about 25.55 percent and 25.25 percent of total milk production respectively.

In case of co-operative dairy household, the milk production per milch animal in summer season of marginal farmer, small farmer, medium farmer and large farmer was came to 299.21 liters (23.49 percent), 376.77 liters (27.60 percent), 418.18 liters (25.99 percent) and 455.88 liters (26.86 percent) of total milk production per annum respectively.

In case of non-co-operative dairy household, the milk production per milch animal in summer season of marginal farmer, small farmer, medium farmer and large farmer was came to 299.21 liters (23.49 percent), 376.77 liters (27.60 percent), 418.18 liters (25.99 percent) and 455.88 liters (26.86 percent) of total milk production per annum respectively.

I can be concluded that, highest milk production was came in winter season (43.44 percent) and followed by rainy season (31.00 percent) and the lowest milk production was came in due to intolerable temperature, fodder, and water problems exist in the Bundelkhand region in summer season (only 25.56 percent).

Table-5:6, Seasonwise milk production per household in different categories of co-operative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household				
Category of Households	Rainy Season (In litre)	Winter Season (In litre)	Summer Season (In litre)	Total milk Production (In litre)
Marginal farmer	573.81 [32.96]	758.17 [43.55]	408.94 [23.49]	1740.92 [100.00]
Small farmer	1003.24 [29.01]	1500.53 [43.39]	954.48 [27.60]	3458.25 [100.00]
Medium farmer	1110.66 [30.00]	1629.33 [44.01]	962.2 [25.99]	3702.19 [100.00]
Large farmer	1531.09 [30.07]	2193.02 [43.07]	1367.64 [26.86]	5091.75 [100.00]
Allaverage	858.45 [30.92]	1208.55 [43.53]	709.36 [25.55]	2776.37 [100.00]
Non-Co-operative Dairy Household				
Marginal farmer	509.17 [31.00]	722.7 [44.00]	410.62 [25.00]	1642.5 [100.00]
Small farmer	1000.45 [33.05]	1269.85 [41.95]	756.78 [25.00]	3027.07 [100.00]
Medium farmer	997.84 [28.92]	1502.28 [43.54]	950.22 [27.54]	3450.34 [100.00]
Large farmer	1567.43 [30.85]	2174.07 [42.79]	1339.3 [26.36]	5080 [100.00]
Allaverage	801.28 [31.10]	1116.9 [43.35]	658.29 [25.55]	2576.47 [100.00]
Overall average	8296.91 [31.00]	11626.48 [43.44]	6864.84 [25.56]	26764.23 [100.00]

~ Figure in parenthesis indicate percentage.

PER HOUSEHOLD: -

The tables 5: 6 demonstrate, season wise milk production *per household* in different categories of co-operative dairy household and non-co-operative dairy household. This table, the point of view study divided season wise in three parts i. e. milk production Rainy season, winter season and summer season.

RAINY SEASON: -

The data explain that, all average milk production per household was came to 858.45 liters per annum of co-operative dairy household and 801.28 liters per annum of non-co-operative dairy household, that is, about 30.92 percent and 31.10 percent in rainy season respectively.

In case of co-operative dairy household, the milk production per household in rainy season of marginal farmer, small farmer, medium farmer and large farmer came to 573.81 liters, 1003.24 liters, 1110.66 liters and 1531.09 liters per annum, who, percentage of total milk production about 32.96 percent, 29.01 percent, 30.00 percent and 30.07 percent respectively.

In case of non-cooperative dairy household the milk production per household in rainy season of marginal farmer, small farmer, medium farmer and large farmer came to 509.17 liters, 1000.45 liters, 997.84 liters and 1567.43 liters per annum, percentage of total milk production about 31.00 percent, 33.05 percent, 28.92 percent and 30.85 percent per annum.

The overall average, the milk production of per milch animal was come to 8296.91 litres (31.00 percent) in rainy season.

WINTER SEASON: -

The data 5: 6 explain that, all average milk production per household came to 1208.55 liters per annum of co-operative dairy household and 1116.9 liters per annum of non-co-operative dairy household, about 43.53 percent and 43.35 percent in winter season respectively.

In case of co-operative dairy household, the milk production per household in winter season of marginal farmer, small farmer, medium farmer and large farmer was came to 758.17 liters, 1500.53 liters, 1629.33 liters and 2193.02 liters per annum, who percentage of total milk production about 43.55 percent, 43.39 percent, 44.01 percent and 43.07 percent gradually.

In case of non-cooperative dairy household, the milk production per household in winter season of marginal farmer, small farmer, medium farmer and large farmer was came to 722.7 liters, 1269.85 liters, 1502.28 liters and 2174.07 liters per annum, who percentage of total milk production about 44.00 percent, 41.95 percent, 43.54 percent and 42.79 percent per annum.

The overall average, the milk production of per milch animal was come to 1162.64 litres (43.44 percent) in winter season.

SUMMER SEASON: -

The table 5: 6 show that, all average milk production per household in summer season came to 709.36 liters per annum of co-operative dairy household and 658.29 litres per annum of non-co-

operative dairy household, who about only 25.55 percent and 25.25 percent of total milk production respectively.

In case of co-operative dairy household, the milk production per household in summer season of marginal farmer, small farmer, medium farmer and large farmer was came to 408.94 liters (23.49 percent), 954.48 liters (27.60 percent), 962.2 liters (25.99 percent) and 1367.64 liters (26.86 percent) of total milk production per annum respectively.

In case of non-co-operative dairy household, the milk production per household in summer season of marginal farmer, small farmer, medium farmer and large farmer was came to 410.62 liters (23.49 percent), 756.78 liters (27.60 percent), 950.22 liters (25.99 percent) and 1339.3 liters (26.86 percent) of total milk production per annum respectively.

I can be concluded that, highest milk production was came in winter season (43.44 percent) and followed by rainy season (31.00 percent) and the lowest milk production was came in due to intolerable temperature, fodder, and water problems exist in the Bundelkhand region in summer season (only 25.56 percent).

Cost of Milk Production per liter: -

The cost, which comes after, deducted the value of dung form the total cost is taken as cost of production of milk as known the net maintenance cost.

The following table 5: 7 show that, cost of milk production per liter- per milch animal in different category of co-operative dairy household & non-co-operative dairy household, the all average cost of milk production per liter was came to Rs. 6.99 of co-operative dairy

Table-5:7, Cost of milk production per litre in different categories of co-operative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household			
Category of Households	Milk Production [In litre]	Net Maintenance cost [Rs.]	Cost of Milk [Rs.]
Marginal farmer	1273.8	9040	7.1
Small farmer	1365.1	9710	7.11
Medium farmer	1609.65	11410	7.09
Large farmer	1697.25	12030	7.09
Allaverage	1423.78	9955.55	6.99
Non-Co-operative Dairy Household			
Marginal farmer	1095	7800	7.12
Small farmer	1135.15	8085	7.12
Medium farmer	1500.15	10689	7.11
Large farmer	1587.75	11300	7.11
Allaverage	1246.68	8745.48	7.01
Overall average	1332.66	9332.95	7

Cost of Milk Production (per litre)

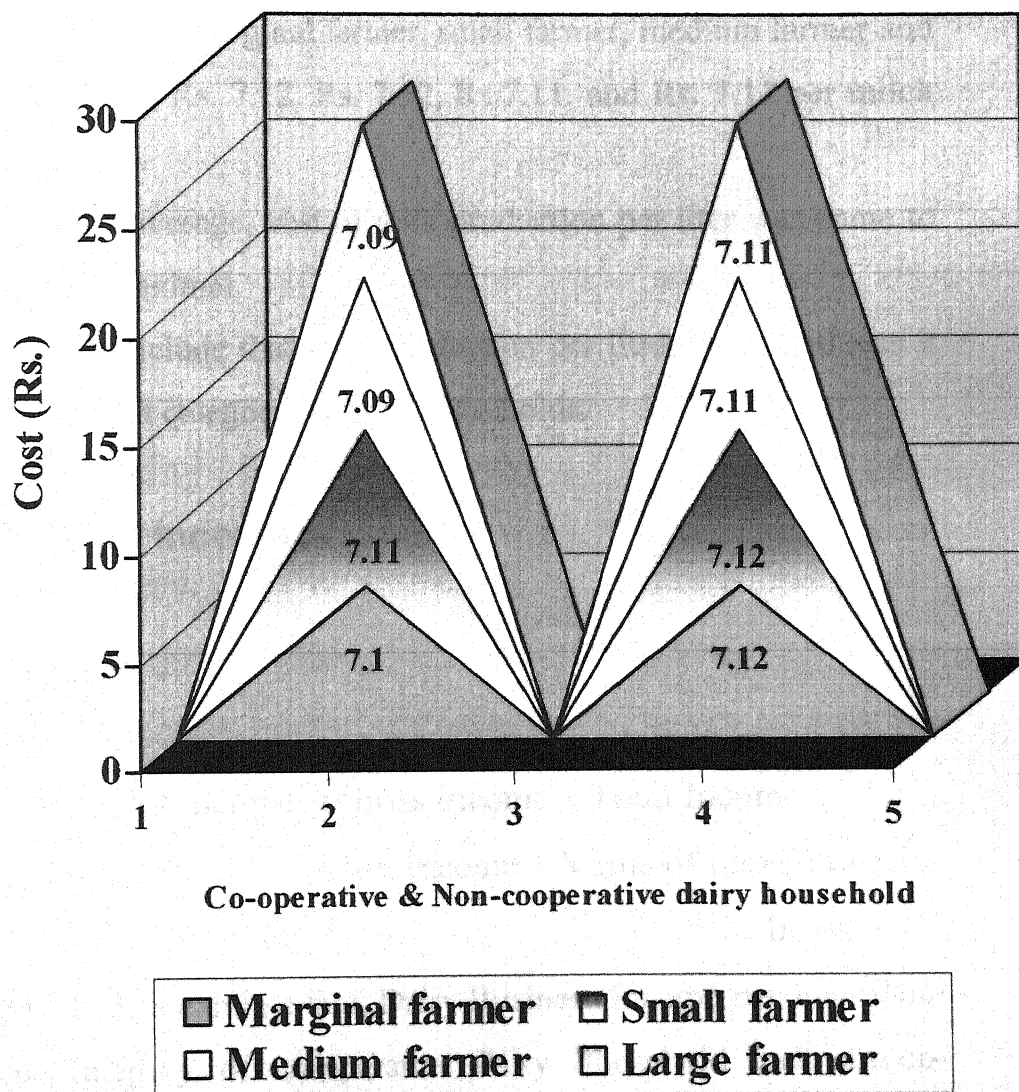


Figure-5:6

household, and Rs. 7.01 per litre, per milch animal of non-co-operative dairy household.

In case of co-operative dairy household, the cost of milk production per liter of marginal farmer, small farmer, medium farmer and large farmer was came to Rs. 7.10, Rs. 7.11, Rs.7.09, and Rs. 7.09 per milch animal respectively.

In case of non-cooperative dairy household the cost of milk production per liter of marginal farmer, small farmer, medium farmer and large farmer have to Rs. 7.12, Rs. 7.12, Rs.7.11, and Rs. 7.11 per milch animal respectively.

The overall average, cost of milk production per liter was came to Rs. 7.00 per milch animal.

It can be conclude that milk production per litres more and less it. in all cases different category of dairy households.

Dairy Business Income :-

per household: -

$$\begin{aligned}\text{Dairy Business Income} &= \text{Gross Income} - \text{Total Income} \\ &= \text{Net Income} + \text{Value of unpaid family} \\ &\quad \text{Income.}\end{aligned}$$

The table 5: 8 exhibits that, Dairy Business Income *per household* in different category of co-operative dairy household and non-co-operative dairy household.

Table-5:8, Dairy business income per household from milk production in different categories of co-operative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household					
Category of Households	Gross Income [Rs.]	Gross Cost [Rs.]	Net Income [Rs.]	Value of unpaid labour [Rs.]	Total [Rs.]
Marginal farmer	21451.5	12915	8536.47	1937.25	10473.7
Small farmer	42601	25700.7	16900.4	3650	20550.4
Medium farmer	30307.6	26243	4064.5	3818.92	7883.42
Large farmer	62571	36090	26481	5070.6	31551.6
All average	34166.7	20264	13902.7	2940.16	16842.8
Non-Co-operative Dairy Household					
Marginal farmer	18667.5	12300	6367.5	2025.75	8393.25
Small farmer	34391.1	21560	12831.1	3776.53	16607.6
Medium farmer	38954.3	25564.5	13389.8	3358	16747.8
Large farmer	57328.8	37600	19728.8	5372.8	25101.6
All average	29201.3	18394.1	10267.2	2964.41	13231.6
Overall average	31684	19599	12084.9	15037.2	27122.2

The all-average dairy business income was came to Rs. 16842.83 per annum of co-operative dairy household, and Rs. 27122.16 per annum of non-co-operative dairy household.

In case of co-operative dairy household the dairy business income per household of marginal farmer, small farmer, medium farmer and large farmer were came to Rs. 10473.72, Rs.20550.37, Rs.7883.42 and Rs. 31551.6 per annum respectively.

In case of non-cooperative dairy household the dairy business income per household of marginal farmer, small farmer, medium farmer and large farmer was came to Rs.8393.25, Rs.16607.6, Rs. 16747.79 and Rs. 25101.6 per annum gradually.

The overall average, dairy business income per household was came to 27122.16 per annum.

Per milch animal: -

The table 5: 9 exhibits that, Dairy Business Income *per milch animal* in different category of co-operative dairy household and non-co-operative dairy household.

The all-average dairy business income was came to Rs. 8637.34 per annum of co-operative dairy household, and Rs. 10402.4 per annum of non-co-operative dairy household.

In case of co-operative dairy household, the dairy business income per milch animal of marginal farmer, small farmer, medium farmer and large farmer was came to Rs.7663.7, Rs.8111.99, Rs.9566.2 and Rs. 10027.2 per annum respectively.

Table-5:9, Dairy business income per milch animal from milk production in different categories of co-operative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household					
Category of Households	Gross Income [Rs.]	Gross Cost [Rs.]	Net Income [Rs.]	Value of unpaid labour [Rs.]	Total [Rs.]
Marginal farmer	15696.2	9450	6246.2	1417.5	7663.7
Small farmer	16816.2	10145	6671.2	1440.79	8111.99
Medium farmer	19765.8	11860	7905.8	1660.4	9566.2
Large farmer	20857	12520	8337	1690.2	10027.2
Allaverage	7521.37	10391.6	7129.57	1507.77	8637.34
Non-Co-operative Dairy Household					
Marginal farmer	12445	8200	4245	1350.5	5595.5
Small farmer	12896.7	8495	4811.65	1416.2	6227.85
Medium farmer	16936.7	11115	5821.65	1460	7281.65
Large farmer	17915.2	11750	6165.25	1679	7844.25
Allaverage	14129.7	9161.65	8968.01	1434.39	10402.4
Overall average	15776.3	9758.86	6017.4	1470.02	7487.42

In case of non-cooperative dairy household, the dairy business income per milch animal of marginal farmer, small farmer, medium farmer and large farmer was came to Rs. 5595.5, Rs.6227.85, Rs. 7281.65 and Rs. 7844.25 per annum gradually.

The overall average, dairy business income per milch animal was came to 7487.42 per annum.

DISTRIBUTION OF MILK OF MARKETING AGENCIES: -

The table 5:10 reveals that distribution of milk in different marketing agencies. Milk marketing agencies means -

“Milk sold though which channel.”

In this table 5: 9 included the following channel: -

- Milkman → Consumer.
- Milkman → Halwai → Consumer.
- Milkman → Vender → Consumer.
- Milkman → Milk Co-operative Society → Consumer.

The distribution of milk through marketing channel 1st came to 53928.8 litres (25.00 percent), channel 2nd 47543.61 litres (22.03 percent), channel 3rd 53325.49 litres (24.71 percent) and channel 4th 60960.88 litres (28.26 percent) per annum. In case of marginal household milk production of channel 1st, 2nd, 3rd and 4th came to 21116.44 litres (32.55 percent), 16925.90 litres (25.85 percent), 7791.80 litres (11.90 percent) and 19643.21 litres (30.00 percent) respectively per annum. In case of small household milk production of channel 1st, 2nd, 3rd and 4th came to 17707.78 litres (25.52 percent), 16471.24 litres (24.11 percent), 17256.89 litres (25.26 percent) and 16881.14 litres

Table-5:10, Distribution of milk marketing agencies per household (per annum)

Category of Household	Marketable Surplus (Litre)	CHANNELS			
		1st (Litre)	2nd (Litre)	3rd (Litre)	4rt (Litre)
Marginal farmer	1091.29 [100.00]	351.94 [32.25]	282.1 [25.85]	129.86 [11.90]	327.39 [30.00]
Small farmer	2277.23 [100.00]	590.25 [25.92]	549.04 [24.11]	575.23 [25.26]	562.7 [24.71]
Medium farmer	2455.72 [100.00]	424.59 [17.29]	508.09 [20.69]	810.88 [33.02]	712.16 [29.00]
Large farmer	3285 [100.00]	661.27 [20.13]	398.47 [12.13]	1205.92 [36.71]	1019.33 [31.03]
Allaverage	1800.42 [100.00]	450.1 [25.00]	369.63 [22.03]	444.88 [24.71]	508.88 [28.26]

~ Figure in parenthesis indicate percentage.

1st- Milkman- Consumer.

2nd- Milkman- Hallway-Consumer.

3rd- Milkman- Vender-Consumer.

4th- Milkman- Cooperative dairy -
Consumer.

Distribution of Milk, Marketing Agencies

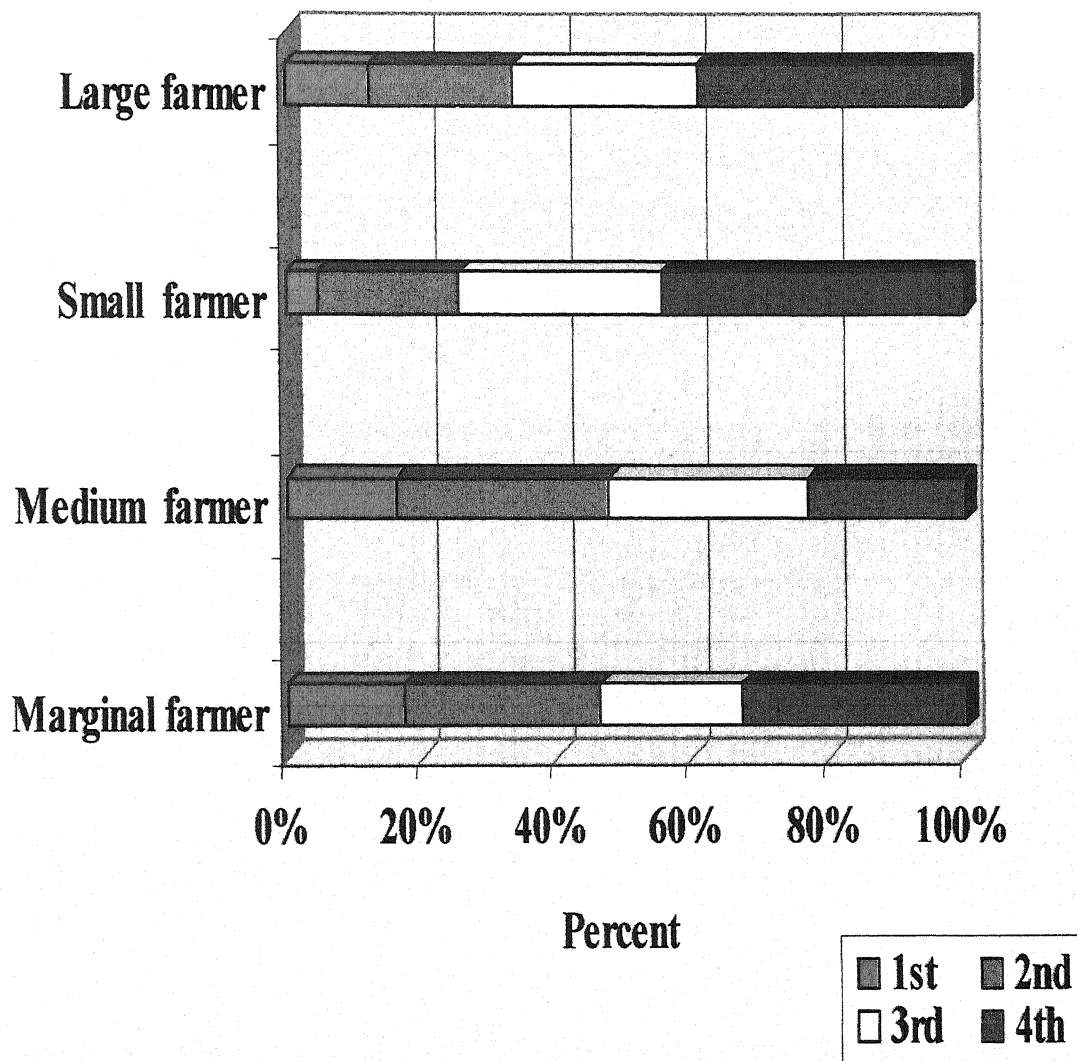


Figure-5:7

1st- Milkman- Consumer.

2nd- Milkman- Hallway-Consumer.

3rd- Milkman- Vender-Consumer.

4th- Milkman- Cooperative dairy -Consumer.

(24.71 percent) respectively per annum. In case of medium household milk production of channel 1st, 2nd, 3rd and 4th came to 8491.88 litres (17.29 percent), 10161.77 litres (20.69 percent), 16217.57 litres (33.02 percent) and 14243.18 litres (29.00 percent) respectively per annum. In case of large household milk production of channel 1st, 2nd, 3rd and 4th came to 6612.70 litres (20.13 percent), 3984.70 litres (12.13 percent), 12059.23 litres (36.71 percent) and 10193.35 litres (31.03 percent) respectively per annum. A perusal of the table distribution of milk marketing agencies *per household* revealed that Channel 4th was more efficient in compares to others. The table further reveals that 1st, 2nd and 3rd Channels more or less equally efficient.



CHAPTER 6

CHAPTER-6

Cost & Return of Milk Production

CHAPTER-6

COST & RETURN OF MILK PRODUCTION

The chapter deals with the Cost & Return of Milk Production in case of household keeping milch animal. The Cost & Return of milk production includes the following table: - Goss Maintenance Cost, Net Maintenance Cost, Variable Cost, Total Fixed Cost, Total Feed Cost, Cost of Human Labour, Gross Output (Income) from milk production, Net Return, Income over feed cost, Gross margin, Input-Output Ratio.

GROSS MAINTENANCE COST: -

PER MILCH ANIMAL: -

The Gross maintenance cost includes the cost of feed, fodder, labour etc. and the interest on the value of animal deprecation i. e. fixed cost as –

Gross Maintenance Cost = Total Fixed Cost + Total Variable Cost.

The table 6: 1 indicates the Goss maintenance cost *per milch animal* in different category of co-operative & non-co-operative dairy household per year.

Table-6:1, Maintenance cost per milch animal in different categories of co-operative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household	
Category of Households	Gross maintenance cost (Rs.)
Marginal farmer	9450
Small farmer	10145
Medium farmer	11860
Large farmer	12520
Allaverage	10543.08
Non-cooperative Dairy household	
Marginal farmer	8200
Small farmer	8495
Medium farmer	11115
Large farmer	11750
Allaverage	9293.91
Overall average	9900.35

The overall average, the gross maintenance cost per milch animal came to Rs 9900.35.

In case of co-operative & non-co-operative dairy household, the average gross maintenance cost per milch animal came to Rs. 10543.08 & Rs. 9293.91 respectively per year.

In case of co-operative dairy household the gross maintenance cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 4550, Rs. 10145, Rs. 11860 and Rs. 12550 gradually per annum.

As for, non-co-operative dairy household the gross maintenance cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 8200, Rs. 8495, Rs. 11115 and Rs. 11750 respectively per year.

It can be concluded that, gross maintenance cost *per milch animal* increased in both cases of co-operative & non-cooperative dairy household with their farm size. The table further revealed that maintenance cost came higher in case of co-operative dairy household compare to non-cooperative dairy household.

PER HOUSEHOLD: -

The table 6: 2 explain the Goss maintenance cost *per household* in different category of co-operative & non-co-operative dairy household per annum.

The overall average, the gross maintenance cost per household came to Rs.19883.21.

Table-6:2, Maintenance cost per household in different categories of co-operative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household	
Category of Households	Gross maintenance cost (Rs.)
Marginal farmer	12915
Small farmer	25700.67
Medium farmer	27278
Large farmer	37560
Allaverage	20559
Non-cooperative Dairy household	
Marginal farmer	12300
Small farmer	22653.33
Medium farmer	25564.5
Large farmer	37600
Allaverage	19207.42
Overall average	19883.21

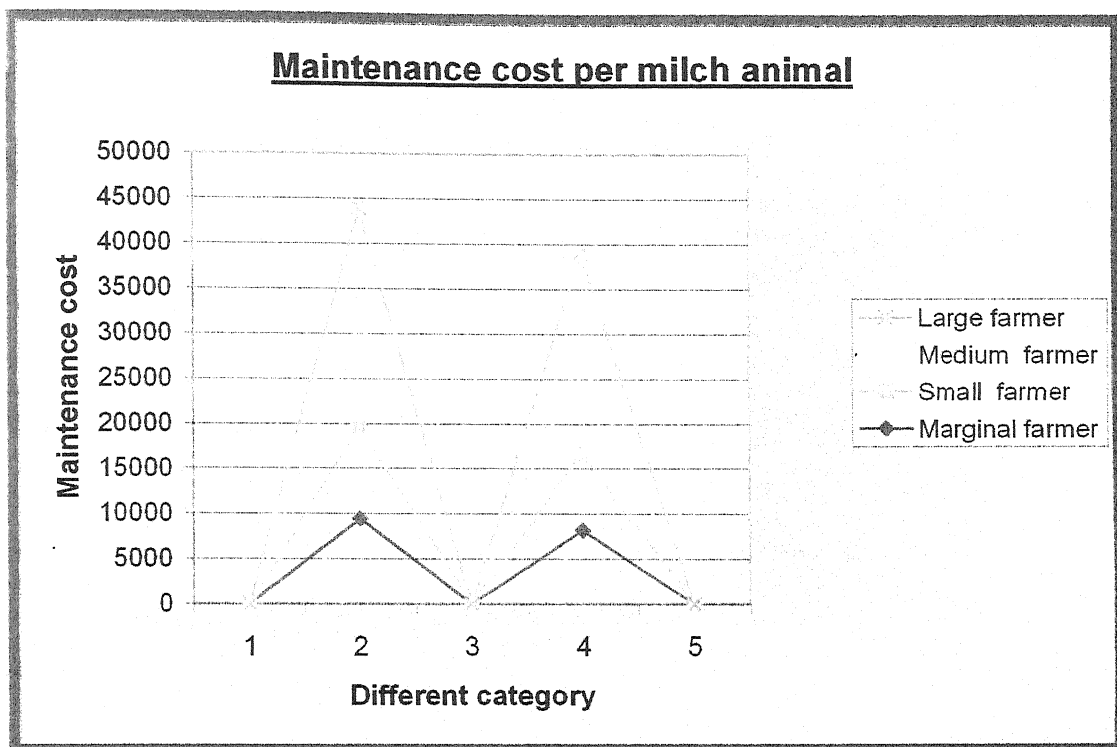


Figure-6:1

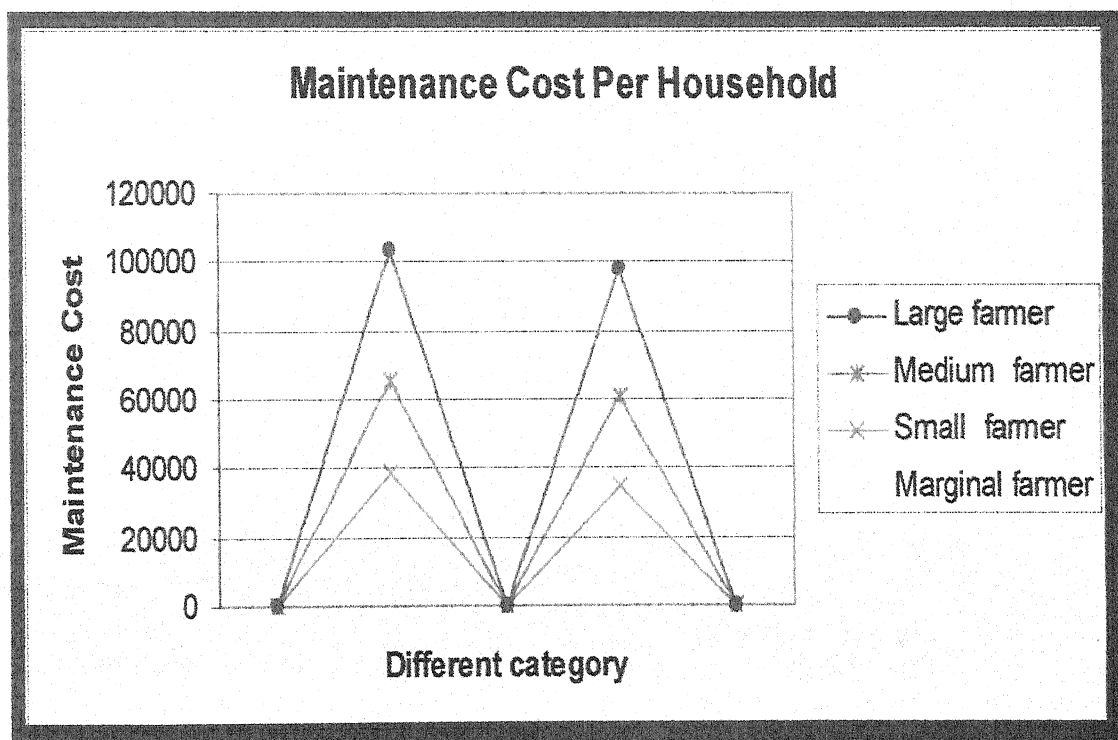


Figure-6:2

In case of co-operative & non-co-operative dairy household, the average gross maintenance cost per household came to Rs. 20559 & Rs. 19207.42 respectively per year.

In case of co-operative dairy household the gross maintenance cost per household of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 12915, Rs. 25700.67, Rs. 27278 and Rs. 37560 respectively per annum.

In case of non-co-operative dairy household the gross maintenance cost per household of marginal farmer, small farmer, medium farmer and large farmer came to Rs.12300, Rs. 22653.33, Rs. 25566.5 and Rs. 37600 respectively per year.

It can be concluded that, gross maintenance cost *per household* increased in both cases of co-operative & non-cooperative dairy household with their farm size. The table further revealed that maintenance cost came higher in case of co-operative dairy household compare to non-cooperative dairy household.

NET MAINTENANCE COST: -

PER MILCH ANIMAL : -

Net maintenance cost = Gross cost – Value of dung.

The table 6:3 revealed, the net maintenance cost *per milch animal* in different category of co-operative & non-co-operative dairy household per year.

Table-6:3, Net-maintenance cost per milch animal in different categories of co-operative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household	
Category of Households	Net-maintenance cost (Rs.)
Marginal farmer	9040
Small farmer	9710
Medium farmer	11410
Large farmer	12030
Allaverage	10107.08
Non-cooperative Dairy household	
Marginal farmer	7800
Small farmer	8085
Medium farmer	10680
Large farmer	11300
Allaverage	8877.74
Overall average	9474.56

The overall average, the net maintenance cost per milch animal came to Rs 9474.56.

In case of co-operative & non-co-operative dairy household, the average net maintenance cost per milch animal came to Rs. 10107.08 & 8877.74 respectively per year.

In case of co-operative dairy household the net maintenance cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 9040, Rs. 9710, Rs. 11410 and Rs. 12030 gradually per annum.

In case of non-co-operative dairy household the net maintenance cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 7800, Rs. 8085, Rs. 10680 and Rs. 11300 respectively per year.

It can be concluded that, net-maintenance cost per milch animal increased with their land holding in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household than non-cooperative dairy household.

PER HOUSEHOLD: -

Net maintenance cost = Gross cost – Value of dung.

The table 6:4 clarify the net maintenance cost *per household* in different category of co-operative & non-co-operative dairy household per annum.

The overall average, the net maintenance cost per household came to Rs. 19028.07.

Table-6:4, Net-maintenance cost per household in different categories of co-operative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household	
Category of Households	Net-maintenance cost (Rs.)
Marginal farmer	12354.67
Small farmer	24598.67
Medium farmer	26243
Large farmer	36090
Allaverage	19708.8
Non-cooperative Dairy household	
Marginal farmer	11700
Small farmer	21560
Medium farmer	24564
Large farmer	36160
Allaverage	18347.33
Overall average	19028.07

In case of co-operative & non-co-operative dairy household, the average net maintenance cost per household came to Rs. 19708.8 & Rs. 18347.33 respectively per annum.

In case of co-operative dairy household the net maintenance cost per household of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 12354.67, Rs. 24598.67, Rs. 26243 and Rs. 36090 respectively per annum.

In case of non-co-operative dairy household the net maintenance cost per household of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 11700, Rs. 21560, Rs. 24564 and Rs. 36160 respectively per year.

It can be concluded that, net-maintenance cost per household increased with their land holding in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household than non-cooperative dairy household.

VARIABLE COST *PER MILCH ANIMAL* : -

“These cost are related to the outlay on variable resources that are used up during the production process since these cost are the unction of output they very with the quantity of production, cost of hired labour, ropes, medicines and cost of feeding, stuff etc. under crop of ex. Expenditure for seed, manure, fertilizers, labour, water change etc. is examples of variable cost.”

Table-6:5, Variable-cost per milch animal in different categories of co-operative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household	
Category of Households	Variable cost (Rs.)
Marginal farmer	7525.98
Small farmer	8085.56
Medium farmer	9447.68
Large farmer	9974.68
Allaverage	8399.43
Non-cooperative Dairy household	
Marginal farmer	6534.58
Small farmer	6765.42
Medium farmer	8851.99
Large farmer	9356.52
Allaverage	7403.01
Overall average	7886.75

The table 6:5 explain, the variable cost *per milch animal* in different category of co-operative & non-co-operative dairy household per year.

The overall average, the variable cost per milch animal came to Rs 7886.75.

In case of co-operative & non-co-operative dairy household, the all-average variable cost per milch animal came to Rs. 8399.43 & Rs. 7403.01 respectively per year.

In case of co-operative dairy household, the average variable cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 7525.98, Rs. 8085.56, Rs. 9447.68 and Rs. 9974.68 gradually per annum.

In case of non-co-operative dairy household the variable cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 6534.58, Rs. 6765.42, Rs. 8851.99 and Rs. 9356.52 respectively per year.

It can be concluded that, variable cost per milch animal increased with their farm size in both cases of co-operative & non-cooperative dairy household it higher in case of co-operative dairy household than non-cooperative dairy household.

TOTAL FIXED COST *PER MILCH ANIMAL* : -

The cost, which is incurred of, fixed capital. It does not vary with the level of production for example depreciation, rent, interest, taxes, repairs and wages etc.

Table-6:6, Total fixed cost per milch animal in different categories of co-operative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household			
Category of Households	Total fixed cost (Rs.)	Depreciation (Rs.)	Interest (Rs.)
Marginal farmer	1924.02	1327.6	596.45
Small farmer	2059.43	1431.3	628.13
Medium farmer	2412.33	1688.6	723.7
Large farmer	2545.31	1788.1	757.23
Allaverage	2143.6	1491.3	652.36
Non-cooperative Dairy household			
Marginal farmer	1665.42	1665.4	507.29
Small farmer	1729.58	1729.6	676.61
Medium farmer	2263.01	2263	882.8
Large farmer	2393.47	2393.5	718.04
Allaverage	1890.9	1890.9	658.75
Overall average	2013.6	1358	655.65

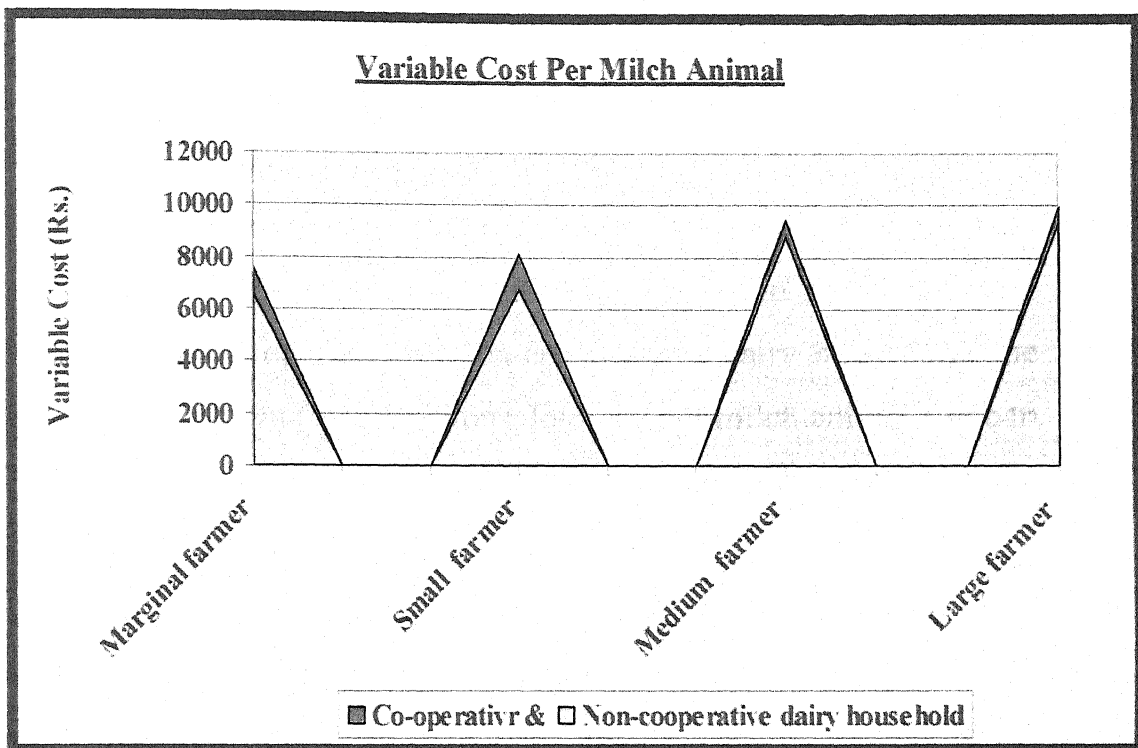


Figure-6: 3

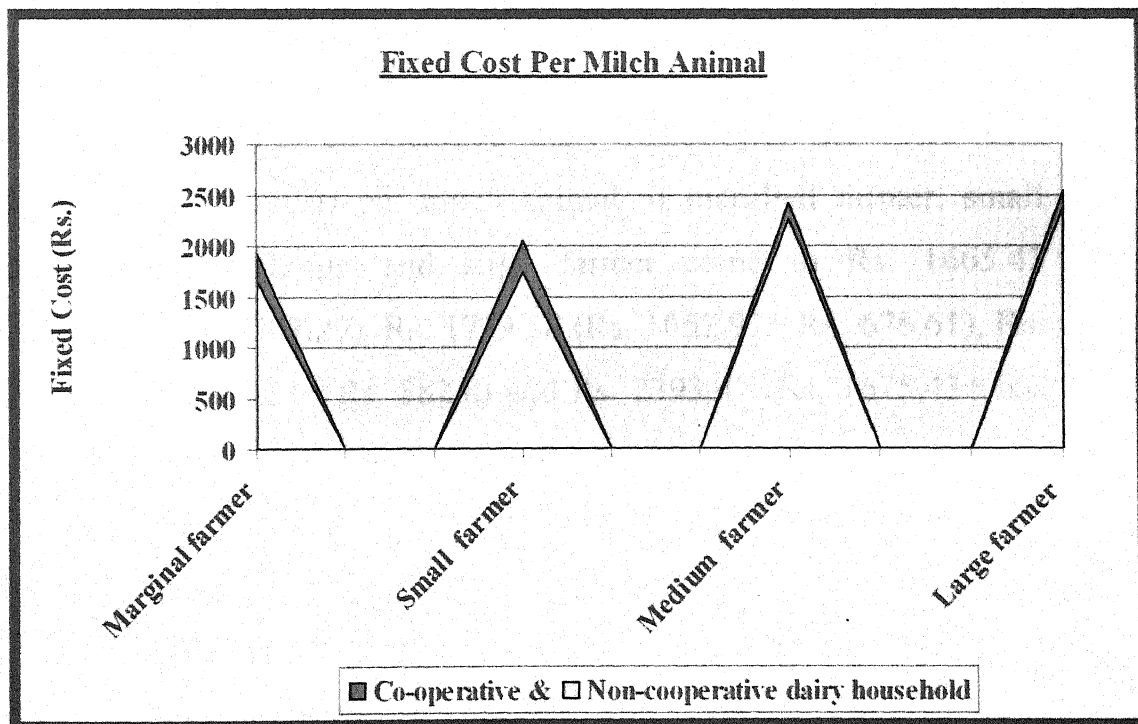


Figure-6: 4

The table 6: 6 exhibits that, the fixed cost (Depreciation+ Interest) per milch animal – per year- per household in different category of co-operative & non-co-operative dairy household.

The overall fixed cost (Depreciation+ Interest) per milch animal came to Rs. 2013.60 (Rs. 1358+ Rs. 655.60) per annum.

In case of co-operative & non-co-operative dairy household, the all-average fixed cost (Depreciation+ Interest) per milch animal came to Rs. 2143.64 (Rs. 1491.28+ Rs. 652.36) & Rs. 1890.90 (Rs. 1232.15+658.75) respectively per year.

In case of co-operative dairy household, the fixed cost (Depreciation+ Interest) per milch animal of marginal farmer, small farmer, medium farmer and large farmer come to Rs. 1924.02 (Rs.1327.57+ Rs. 596.45), Rs. 2059.43 (Rs. 1431.31+ Rs. 628.13), Rs. 2412.33 (Rs. 1688.63+ Rs. 723.70) and Rs. 2545.31 (Rs. 1788.08+ Rs. 757.23) respectively per annum.

In case of non-co-operative dairy household, the fixed cost (Depreciation+ Interest) per milch animal of marginal farmer, small farmer, medium farmer and large farmer come to Rs. 1665.42 (Rs.1158.13+ Rs. 507.29), Rs. 1729.58 (Rs. 1052.97+ Rs. 676.61), Rs. 2263.01 (Rs. 1380.21+ Rs. 882.8) and Rs. 2393.47 (Rs. 1675.43+ Rs. 718.04) respectively per annum.

It can be concluded that, fixed cost per milch animal increased with their farm size in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household in compare to non-cooperative dairy household.

Table-6:7, Total feed cost per milch animal in different categories of co-operative dairy & non-cooperative dairy household (per annum).

(In Rs.)

Co-operative Dairy Household				
Category of Households	Green Fooder	Dry Fooder	Concentrate	Total Cost
Marginal farmer	1717.79	3189.59	935.43	5842.81
Small farmer	1868.46	3470	1016.85	6355.31
Medium farmer	2188.44	4064.89	1192.88	7446.21
Large farmer	2324.26	4323.16	1269	7916.42
Allaverage	1937	3598.06	1055.27	6590.33
Non-cooperative Dairy household				
Marginal farmer	1456.3	2704.56	792.54	4953.4
Small farmer	1501.46	2788.43	817.12	5107.01
Medium farmer	2078.33	3860.36	1132.86	7071.55
Large farmer	2152.75	4004.15	1175.36	7332.26
Allaverage	1676.11	3113.69	912.99	5702.79
Overall average	1802.77	3348.84	982.06	6133.67

THE FEED COST PER MILCH ANIMAL : -

The table 6: 7 explain that the feed cost per milch animal in different category co-operative & non-co-operative dairy household. The feed included- green fodder, dry fodder and concentrate.

The overall feed cost (green fodder, dry fodder and concentrate) per milch animal came to Rs. 3133.67 (Rs. 1802.77, Rs. 3348.84 and Rs. 982.06) per annum.

In case of co-operative & non-co-operative dairy household, the all-average feed cost (green fodder, dry fodder and concentrate) per milch animal came to Rs. 6590.33 (Rs. 1937, Rs. 3598.06 and Rs. 1055.27) & Rs. 5702.77 (Rs. 1676.11, Rs. 3113.69 and Rs. 912.99) respectively per year.

In case of co-operative dairy household the feed cost (green fodder, dry fodder and concentrate) per milch animal of marginal farmer, small farmer, medium farmer and large farmer come to Rs. 5842.81 (Rs. 1717.79, Rs. 3189.59 and Rs. 935.43), Rs. 6355.31 (Rs. 1868.46, Rs. 3470 and Rs. 1016.85), Rs. 7446.21 (Rs. 2188.44, Rs. 4064.89 and Rs. 1192.88) and Rs. 7916.42 (Rs. 2324.26, Rs. 4323.16 and Rs. 1269) respectively per annum.

In case of non-co-operative dairy household the total feed cost (green fodder, dry fodder and concentrate) per milch animal of marginal farmer, small farmer, medium farmer and large farmer come to Rs. 4953.41 (Rs. 1456.30, Rs. 2704.56 and Rs. 792.54), Rs. 5107.01 (Rs. 1501.46, Rs. 2788.43 and Rs. 817.12) Rs. 7071.54 (Rs. 2078.33,

Table-6:8, Human labour cost per milch animal in different categories of co-operative dairy & non-cooperative dairy household (per annum).

Co-operative Dairy Household	
Category of Households	Human labour cost (Rs.)
Marginal farmer	1417.5
Small farmer	1440.79
Medium farmer	1660.4
Large farmer	1690.2
Allaverage	1507.77
Non-cooperative Dairy household	
Marginal farmer	1350.5
Small farmer	1416.2
Medium farmer	1460
Large farmer	1679
Allaverage	1434.39
Overall average	1470.02

Human Labour Cost

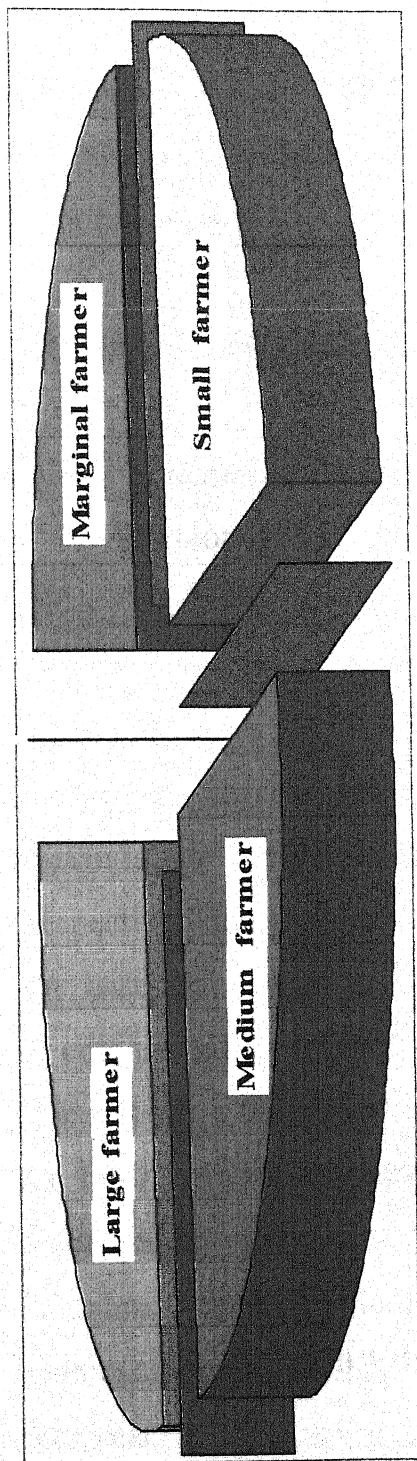


Figure-6:5

Rs. 3860.36 and Rs.1132.86) and Rs. 7332.27 (Rs. 2152.75, Rs. 4004.15 and Rs.1175.36) respectively per annum.

The study revealed that, feed cost *per milch animal* increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household.

COST OF HUMAN LABOUR: -

The table 6: 8 demonstrate that, the cost of human labour per milch animal in different category co-operative & non-co-operative dairy household.

The overall average, human labour cost per milch animal came to Rs 1470.02.

In case of co-operative & non-co-operative dairy household, the all-average human labour cost per milch animal came to Rs. 1507.77 & Rs. 1434.39 respectively per year.

In case of co-operative dairy household, the average human labour cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 1417.5, Rs. 1440.79, Rs. 1660.4 and Rs. 1690.2 gradually per annum.

In case of non-co-operative dairy household, the human labour cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 1350.5, Rs. 1416.2, Rs. 1460 and Rs. 1679 respectively per year.

It can be concluded that, human labour cost per milch animal increased with their farm size in both cases of co-operative & non-

Table-6:9, Gross income from milk production per milch animal in different categories of co-operative dairy & non- cooperative dairy household (per annum).

Co-operative Dairy Household	
Category of Households	Gross Income (Rs.)
Marginal farmer	15696.2
Small farmer	16816.2
Medium farmer	19765.8
Large farmer	20857
Allaverage	17521.37
Non-cooperative Dairy household	
Marginal farmer	12445
Small farmer	12896.65
Medium farmer	16936.65
Large farmer	17915.24
Allaverage	14129.66
Overall average	15776.26

cooperative dairy household it higher in case of co-operative dairy household than non-cooperative dairy household.

GROSS OUTPUT FROM MILK PRODUCTION: -

“It is the value of total farm product (main and by – product) in the year. It is obtained by multiplying the main by products to their prices.”

PER MILCH ANIMAL: -

There, Gross Income = Value of milk + Value of dung.

$$\frac{\text{Gross Income}}{\text{Total milch animal}} \\ = \text{Gross Income per milch animal}$$

The table 6: 9 reveal that, the Gross output from milk production per milch animal in different category of co-operative & non-co-operative dairy household.

The overall average gross output from milk production per milch animal was came to Rs 15776.26.

In case of co-operative & non-co-operative dairy household, the all-average gross output from milk production per milch animal came to Rs. 17521.37 & Rs. 14129.66 respectively per year.

In case of co-operative dairy household, the gross output from milk production per milch animal of marginal farmer, small farmer,

Table-6:10, Gross output from milk production per household in different categories of co-operative dairy & non- cooperative dairy household (per annum).

Co-operative Dairy Household	
Category of Households	Gross Income (Rs.)
Marginal farmer	21451.47
Small farmer	42601.04
Medium farmer	45461.34
Large farmer	62571
Allaverage	34166.67
Non-cooperative Dairy household	
Marginal farmer	18667.5
Small farmer	34391.07
Medium farmer	38954.29
Large farmer	57328.8
Allaverage	29201.3
Overall average	31683.98

Gross Income from Milk Production

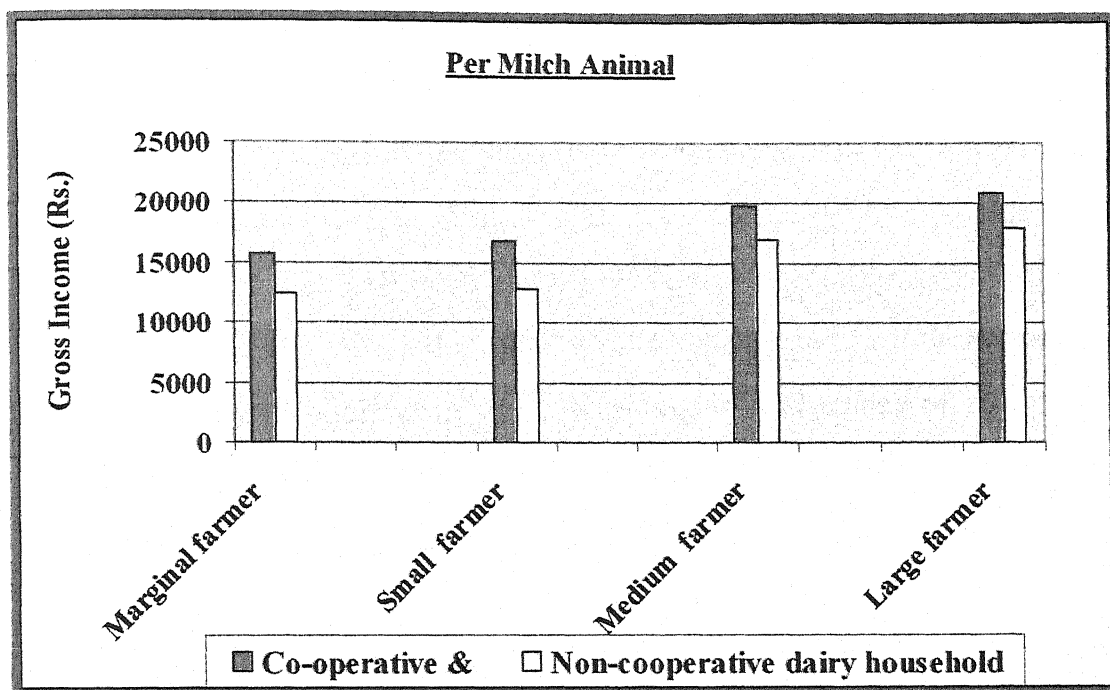


Figure-6:6

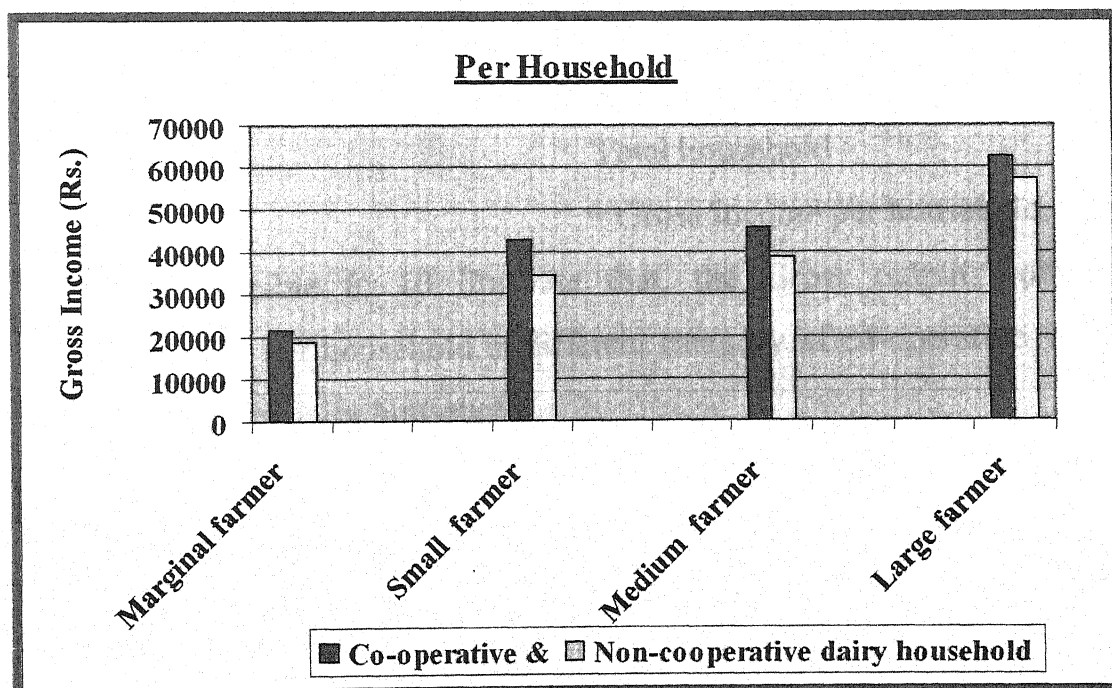


Figure-6:7

medium farmer and large farmer was came to Rs. 15696.2, Rs. 16816.2, Rs. 19765.8 and Rs. 20857 respectively per year.

As a result, In case of non-co-operative dairy household, the gross output from milk production per milch animal of marginal farmer, small farmer, medium farmer and large farmer come to Rs. 12445, Rs.12896.65, Rs. 16936.65 and Rs. 17915.24 respectively per annum.

It can be concluded that, gross output *per milch animal* was increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

PER HOUSEHOLD: -

There, Gross Income = Value of milk + Value of dung.

$$\frac{\text{Gross Income}}{\text{Total household}} \\ = \text{Gross Income per household.}$$

The table 6: 10 illustrate that, the Gross output from milk production per household in different category of co-operative & non-co-operative dairy household.

The overall average gross output from milk production per household was come to Rs 31683.98.

In case of co-operative & non-co-operative dairy household, the all-average gross output from milk production per household was came to Rs. 34166.67 & Rs. 29201.30 respectively per year.

Table-6:11, Net return from dairy enterprise per milch animal in different categories of co-operative dairy & non- co-operative dairy household (per annum).

Co-operative Dairy Household			
Category of Households	Gross Income (Rs.)	Gross Cost (Rs.)	Net Income (Rs.)
Marginal farmer	15696.2	9450	6246.2
Small farmer	16816.2	10145	6671.2
Medium farmer	19765.8	11860	7905.8
Large farmer	20857	12520	8337
Allaverage	17521.37	10543.08	6978.29
Non-cooperative Dairy household			
Marginal farmer	12445	8200	4245
Small farmer	12896.65	8495	4401.65
Medium farmer	16936.65	11115	5821.65
Large farmer	17915.24	11750	6165.24
Allaverage	14129.66	9293.91	4835.75
Overall average	15776.26	9900.35	5875.91

In case of co-operative dairy household, the gross output from milk production per household of marginal farmer, small farmer, medium farmer and large farmer was came to Rs. 21451.47, Rs. 42601.04, Rs. 45461.34 and Rs. 62517 respectively per annum.

In case of non-co-operative dairy household, the gross output from milk production per household of marginal farmer, small farmer, medium farmer and large farmer come to Rs. 18667.5, Rs.34391.07, Rs. 38954.29 and Rs. 57328.8 respectively per annum.

It can be concluded that, gross output *per household* was increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

NET RETURN FROM DAIRY ENTERPRISE: -

PER MILCH ANIMAL : -

The net income is the different between gross income and total cost incurred in production.

$$\text{Net return} = \text{Gross income} - \text{Net Income.}$$

The table 6: 11show the net return from dairy enterprise per milch animal in different category of co-operative & non-co-operative dairy household.

It could be from result in table - 6:11, the overall average net return from dairy enterprise per milch animal was came to Rs. 5875.91 per annum.

In case of co-operative & non-co-operative dairy household, the all-average net return from dairy enterprise per milch animal was came to Rs. 6978.29 & Rs. 4835.75 respectively per annum.

In case of co-operative dairy household, the net return from dairy enterprise per milch animal of marginal farmer, small farmer, medium farmer and large farmer was came to Rs. 6246.2, Rs. 6671.2, Rs. 7905.8 and Rs. 8337 respectively per annum.

As a result, In case of non-co-operative dairy household, the net return from dairy enterprise per milch animal of marginal farmer, small farmer, medium farmer and large farmer was came to Rs. 4245, Rs. 4401.65, Rs. 5821.65 and Rs. 6165.24 respectively per annum.

The results of the present study indicate that, net return from dairy enterprise per milch animal was increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

PER HOUSEHOLD: -

The table 6: 12, explicate the net return from dairy enterprise per household in different category of co-operative & non-co-operative dairy household.

Table-6:12, Net return from dairy enterprise per household in different categories of co-operative dairy & non- co-operative dairy household (per annum).

Co-operative Dairy Household			
Category of Households	Gross Income (Rs.)	Gross Cost (Rs.)	Net Income (Rs.)
Marginal farmer	21451.47	12915	8536.47
Small farmer	42601.04	25700.67	16900.37
Medium farmer	45461.34	27278	18183.34
Large farmer	62571	37560	25011
Allaverage	34166.67	20559	13607.67
Non-cooperative Dairy household			
Marginal farmer	18667.5	12300	6367.5
Small farmer	34391.07	22653.33	11737.74
Medium farmer	38954.29	25564.5	13389.79
Large farmer	57328.8	37600	19728.8
Allaverage	29201.3	19207.42	9993.88
Overall average	31683.98	19883.21	11800.77

It could be from consequence in table-6: 12, the overall average net return from dairy enterprise per household was came to Rs. 11800.77 per annum.

In case of co-operative & non-co-operative dairy household, the all-average net return from dairy enterprise per household was came to Rs. 13607.67 & Rs. 9993.88 respectively per annum.

In case of co-operative dairy household, the net return from dairy enterprise per household of marginal farmer, small farmer, medium farmer and large farmer was came to Rs. 8536.47, Rs. 16900.37, Rs. 18183.34 and Rs. 25011 respectively per annum.

As a result, In case of non-co-operative dairy household, the net return from dairy enterprise per milch animal of marginal farmer, small farmer, medium farmer and large farmer was came to Rs. 4245, Rs. 4401.65, Rs. 5821.65 and Rs. 25011 respectively per annum.

The results of the present study indicate that, net return from dairy enterprise per household was increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

INCOME OVER FEED COST: -

Income over feed cost = Gross Income – Total feed cost.

Table-6:13, Income over feed cost per milch animal in different categories of co-operative dairy & non- co-operative dairy household (per annum).

Co-operative Dairy Household	
Category of Households	Feed Cost (Rs.)
Marginal farmer	9853.39
Small farmer	10460.89
Medium farmer	12319.58
Large farmer	12940.58
Allaverage	10931.06
Non-cooperative Dairy household	
Marginal farmer	7491.59
Small farmer	7789.63
Medium farmer	9865.1
Large farmer	10582.98
Allaverage	8426.87
Overall average	9642.6

The table 6: 13 reveals the Income over feed cost per milch animal in different category of co-operative dairy household & non-co-operative dairy household.

The overall average income over feed cost per milch animal was came to Rs. 9642.60 per year.

In case of co-operative & non-co-operative dairy household, the all-average income over feed cost per milch animal was came to Rs. 10931.06 & Rs. 8426.87 respectively per annum.

In case of co-operative dairy household, the income over feed cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer was came to Rs. 9853.39, Rs. 10460.89, Rs. 12319.58 and Rs. 12940.58 respectively per annum.

In case of non-co-operative dairy household, income over feed cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer was came to Rs. 7491.59, Rs. 7789.63, Rs. 9865.10 and Rs. 10582.98 correspondingly per annum.

The results of the present study highlight that, income over feed cost per milch animal was improved with their farm size of holding in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

GROSS MARGIN: -

Gross margin = Net Income + Total Feed Cost.

Gross Margin Per Milch Animal

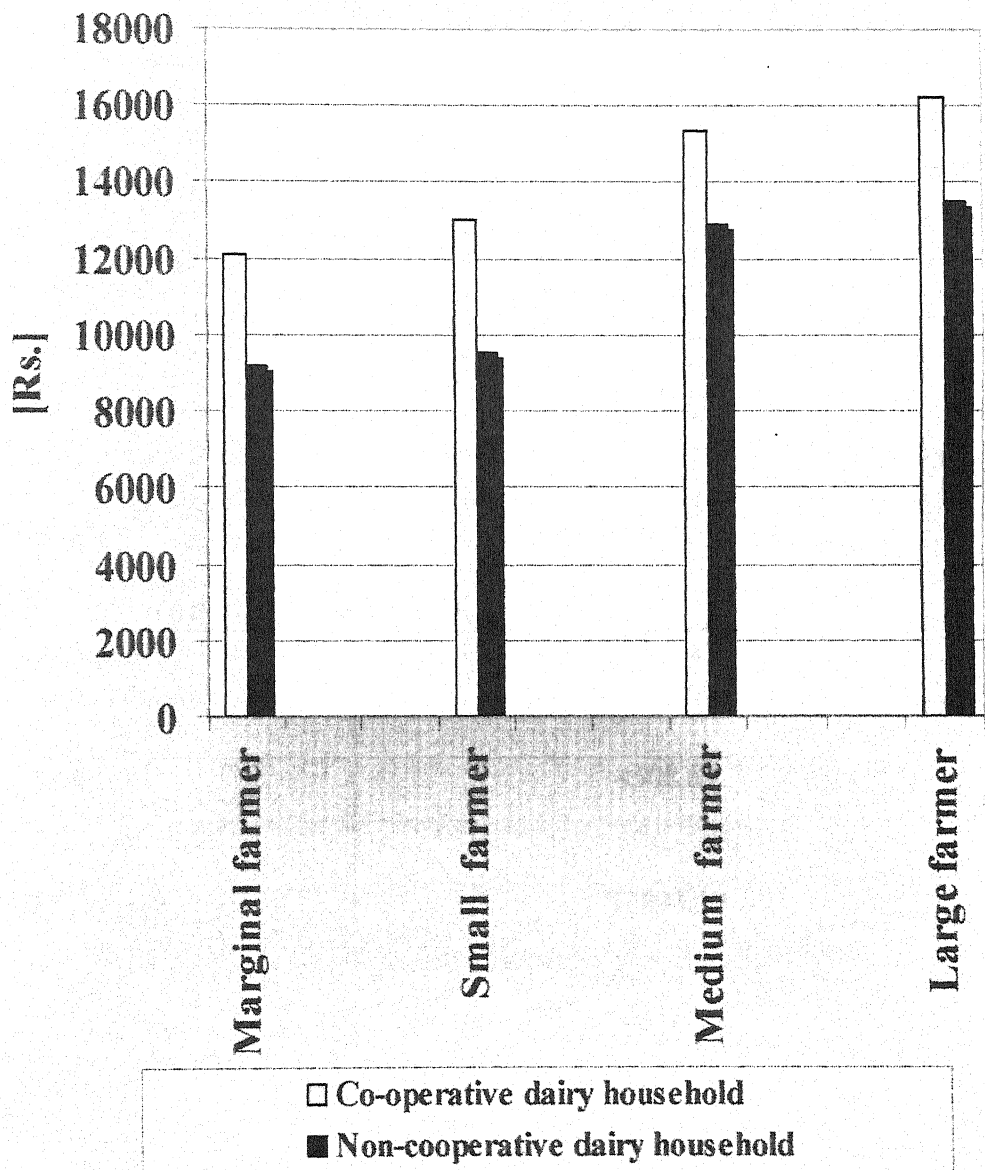


Figure-6:8

table-6:14, gross margin per milch animal in different categories of co-operative dairy & non- co-operative dairy household (per annum).

Co-operative Dairy Household	
Category of Households	Gross Margin (Rs.)
Marginal farmer	12089.01
Small farmer	13026.51
Medium farmer	15352.01
Large farmer	16253.42
Allaverage	13568.6
Non-cooperative Dairy household	
Marginal farmer	9198.41
Small farmer	9508.67
Medium farmer	12893.19
Large farmer	13497.52
Allaverage	10538.54
Overall average	12009.57

The table 6: 14 verify the gross margin per milch animal in different category of co-operative & non-co-operative dairy household.

The overall average gross margin per milch animal was to 12009.57 per year.

In case of co-operative & non-co-operative dairy household, the all-average gross margin per milch animal was came to Rs. 13568.60 & Rs. 10538.54 respectively per annum.

In case of co-operative dairy household, the gross margin per milch animal of marginal farmer, small farmer, medium farmer and large farmer was came to Rs. 12089.01, Rs. 13026.51, Rs. 15352.01 and Rs. 16253.42 per year respectively.

In view of that, the table 6: 14, In case of non-co-operative dairy household the gross margin per milch animal of marginal farmer, small farmer, medium farmer and large farmer come to Rs.9198.41, Rs. 9508.67, Rs. 12893.19 and Rs. 13497.52 per year respectively per annum.

It can be concluded that, gross margin per milch animal was increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

INPUT – OUTPUT RATIO: -

“It is the proportionate amount of output rupees over the per unit rupees of input value used in the production of output.”

Table-6:15, Input-output ratio per milch animal in different categories of co-operative dairy & non- co-operative dairy household (per annum).

Co-operative Dairy Household	
Category of Households	Input-Output Ratio (Rs.)
Marginal farmer	1.661
Small farmer	1.657
Medium farmer	1.666
Large farmer	1.666
Allaverage	1.662
Non-cooperative Dairy household	
Marginal farmer	1.518
Small farmer	1.518
Medium farmer	1.524
Large farmer	1.525
Allaverage	1.525
Overall average	1.593

Input - Output Ratio

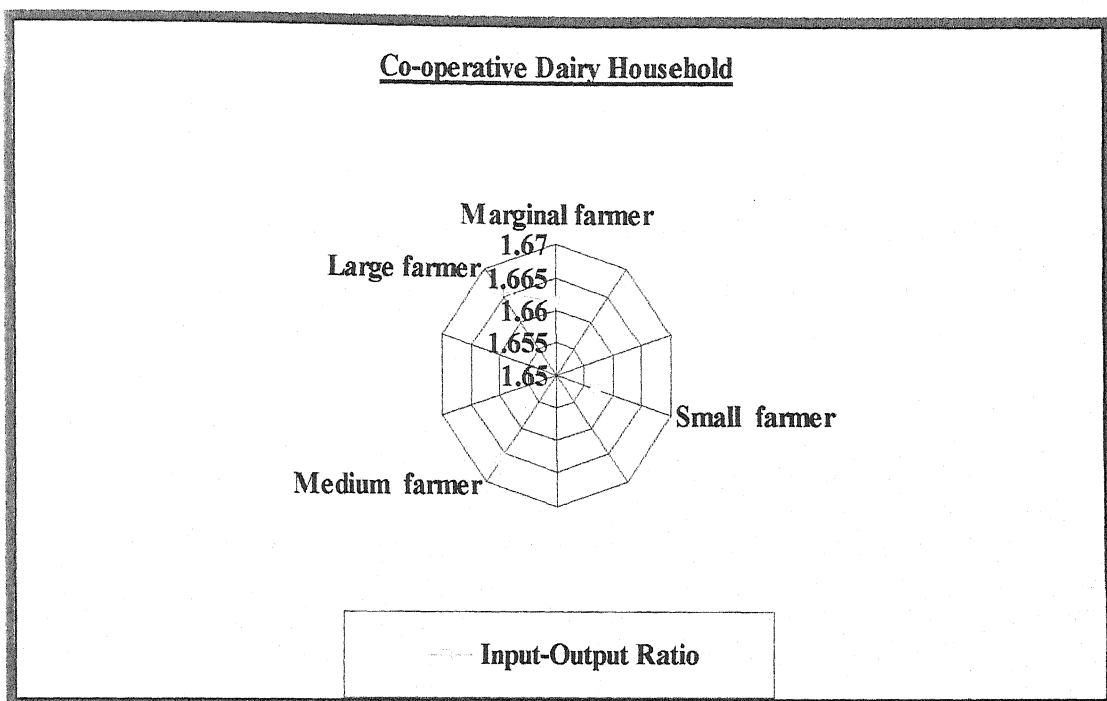


Figure-6:9

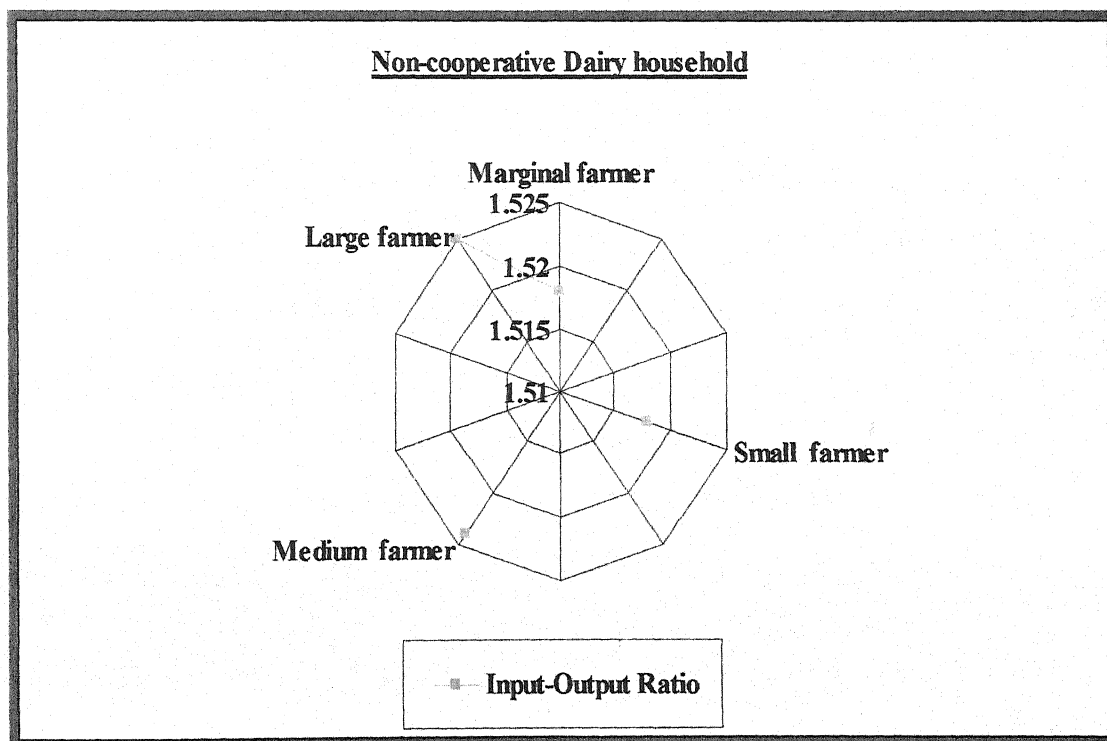


Figure-6:10

$$\text{Input - Output Ratio} = \frac{\text{Gross Income}}{\text{Gross Cost}}$$

The table 6:15, illustrate the input – output ratio per milch animal in different category of co-operative & non-co-operative dairy household.

The overall average, the input – output ratio per milch animal was came to 1.593.

In case of co-operative & non-co-operative dairy household, the all-average input – output ratio per milch animal was came to 1.662 & 1.520 respectively.

In case of co-operative dairy household, the input – output ratio per milch animal of marginal farmer, small farmer, medium farmer and large farmer was came to Rs. 1.661, Rs. 1.657, Rs. 1.666 and Rs. 1.666 respectively.

In case of non-co-operative dairy household input – output ratio per milch animal of marginal farmer, small farmer, medium farmer and large farmer come to Rs.1.518, Rs. 1.518, Rs. 1.524 and Rs. 1.525 respectively per annum.

It can be concluded that, input – output ratio was higher in case of co-operative dairy household compared to non-co-operative dairy household.

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CHAPTER-7

Summary And Conclusion

CHAPTER-7

SUMMARY AND CONCLUSION

India is predominantly an agricultural country with about 70% of its population dependent on income from agriculture. Animal husbandry is an adjunct to crop agriculture and cattle and buffaloes are kept for milk production, motive power for various farm operations, village transport, irrigation, and production of manure. The animals are generally maintained on agricultural byproducts and crop residues. Mostly small and marginal farmers and landless labourers with holding size of 2-3 animals per farm farmer do animal rearing. Average land holding with these owners is very meager, being $\frac{1}{2}$ to 2 acres. Livestock rearing provides employment and supplementary income to the vast majority of rural farmers, the majority of who are landless and marginal farmers.

India had 204 million cattle and 84 million buffaloes. The total crossbred female population, including young stock was estimated to be about 10.6 million in 1992, of which the southern region accounted for about 45%. The share of other regions was: northern (25%), eastern (20%) and western (10%). In areas where cross - breeding is getting popular, the population of low producing *desi* cows is declining. The density of bovine population varied as per land area, agricultural conditions, availability of feed and fodder and socio-economic conditions. On an average 100 ha of cropped area sustained 151 bovine comprising 111 cattle and 40 buffaloes. Stocking rate differed significantly in different regions. The cattle density per 100 ha. of cropped area was highest in the eastern region (182)

lowest in the northern region (90) whereas reverse was true for buffaloes (52 in northern and 26 in southern region).

Cattle were fairly distributed all over the country (18-31%). The concentration of buffaloes was highest in northern region (46%) and lowest in eastern region (11%). The productivity per animal between regions varied due to quality of cattle and buffaloes and availability of inputs as especially feed and fodder.

The gross value of output from livestock sector alone at current prices was about Rs. 1114 billion (1997-98), which is about 25% of the value of the output of Rs. 4495 billion from agriculture sector. This excludes the contribution of the animal draught power. Milk alone contributed around 63% to the total output from livestock. Cattle and buffaloes in addition to providing much needed milk and to some extent meat play an important role in utilization of agricultural by-products, which are non-edible to human beings. They also provide raw materials/ by-products such as hides and skins, blood, bone, fat and casings for industrial use. Farm manure is a useful income generating products of the sector. Animal power for transportation and agricultural operations, particularly in rural areas also makes a significant contribution.

A marginal increase in milk production from 17 million tones in 1995-51 to 22 million tones in 1970-71 was achieved. The increase, however, was large between 1980-81 (31.6 million tones) and 1990-91 (53.7 million tones). The production of milk for the year 1998-99 was 74.7 million tones which would make per capita availability to be 2 12 g per day against the recommended level of 220g. This enhanced growth in milk production is

because of various cattle and buffalo development programmes and large scale crossbreeding in dairy cattle.

Around 70.6 million draught animals (mostly cattle and buffalo) contribute 20% of the energy input into crop farming. Although contribution of draught (DAP) sharply reduced from 72% in 1961 to 23% in 1991 mainly due to mechanization, the requirement of DAP shall continue to be around 20% in years to come.

A large increase in buffalo meat production both for internal consumption and export has been noted in the last few years. The export of buffalo meat went up from 101,666 tonnes valued at Rs. 2,808 million in 1995-96 to 176,329 tonnes valued at Rs. 7,293 million in 1997-98. This export is going to go up in view of establishment of export abattoirs and improvement of existing abattoirs. Considerable export earnings are obtained from export of animal by-products.

Artificial insemination network in addition to providing semen of indigenous cattle and buffalo breeds and crossbred cattle is also used for dissemination of semen of temperate dairy cattle through crossbreeding to increase milk production. To meet the semen requirement, sires of various cattle breeds maintained at the main germplasm units some of which also have the facilities of deep-freezing of semen. Improvement in cattle and buffalo production is also directed at improvement through feeding, generation of marketing facilities, advisory service and veterinary aid.

Institutional structures funded by government also exist. These maintain herds of cattle and buffalo which act as nucleus or multiplier herds for purposes of training and research. Some farms have been established for production quality bulls and undertaking progeny testing programmes for

some important indigenous breeds. Large government herds like military dairy farm also exist for commercial milk production. These herds are being used for developing new dairy breeds and for spreading superior germplasm to rural areas for improvement of native cattle.

The operation flood (FO), which has been implemented in three, phases over 26 years covers some nine million-farmer families in 170 milk – sheds in 22 states union territories under co-operative umbrella. The operation flood programmed also provides animal health, breeding and marketing facilities. It also available compound and other feed and related technologies for improved cattle and buffalo productivity.

The advances in animal husbandry, in general, and dairying (crossbred cattle and buffalo) in particular have greatly helped in improving the economic status of rural population in India. The availability of crossbred dairy animals and high producing buffaloes has made dairying a remunerative business. Crop and dairy enterprise combination among various livestock is best suited for most of the areas. Milk production through crossbred chattel has led to increase in income of the farmers in almost all the regions of the country including drought prone, dry land and rain fed areas. Dairy enterprise was on the top with regard to profit in marginal, small and medium category of farmers.

India accounts for a significant share of world's livestock resources with nearly 57 percent of world's buffaloes, 16.2 percent of cattle, 16.2percent of goats, 5.7 percent of sheep and 5 percent of poultry (FAO, 2004). Though the contribution of agriculture and allied sectors to the national gross domestic (55 percent in the early 1950s to 39.5 percent in 1981-82 and 23.9 percent in 2001-02), livestock sector has been among the

few high- growth sectors in rural India. The importance of livestock sub-sector can be gauged from the contribution it makes to the national economy. Livestock sector accounted for 25.5 percent of agricultural GDP, and about 5.6 percent of total GDP in 2001-02. The share of livestock in the gross value of agricultural outputs (at 1993-94 prices) has increased from 18.6 percent in 1971-72 to 35.5 percent in 2001-02(CSO, 2003). The dairy sector contributes the largest share in agricultural GDP. The large contribution that livestock sector makes to the national economy is a reflection of multiple roles that livestock plays in the farming systems in the country.

The growth in value of output of major livestock products in the country at 1993-94 constant prices over the last five decades. The total livestock output has increased more than four times in the last five decades. According to the Central Statistical Organisation (CSO) estimates, the gross value of output from Rs. 20,856 crores in 1950-51 to Rs. 88,331 crores in 2001-02(CSO, 2003). The dairy and poultry are high- growth sectors and is reflected in the growing importance of the contribution of these sub-sectors in the livestock economy. While output in dairy sector increased by 11.2 times and poultry meat by five times. The wool and hair, and dung are the slow-growth sub-sector. The share of milk group in total value of output from livestock sector has increased from about 55 percent in 1951-52 to over 68 percent in 2001-02 (Table-1: 1). The share of meat sector has declined from 20.8 percent to 16.8 during the same period but the share of poultry sector (meat and eggs) has increased from 5.8 percent to 10.3 percent. The share of dung (fuel and manure) has declined significantly from 21.8 percent in 1950-51 to about 7 percent in 2001-02. The use of

dung as fuel has declined significantly from 12.3 percent in early 1950s to nearly 4 percent in 2001-02, while the share of dung as source of manure has fallen from 0.9 percent to 0.25 percent over the same period. The importance of poultry sector has increased at a faster rate compared to other sub-sectors during the last two decades. The share of poultry has increased from about 7.7 percent in 1981-82 to little over 10 percent in 2001-02, while the share of meat sector has remained almost constant.

The value of output from livestock sector grew at an annual compound growth rate of 3.12 percent between 1950-51 and 2001-02, ranging from 0.72 percent in the sixties to 4.77 percent in the 1980s (Table-1: 2). Among all livestock products, eggs witnessed the highest growth (5.37 percent), followed by poultry meat (3.94 percent), and milk growth (3.65 percent). The wool and hair sub-sector registered a negative growth. All livestock sub-sector registered the highest growth during the decade of 1980s except for meat products and dung, while in 1990s there was deceleration in growth in all sub-sector is mainly attributed to the successful implementation of the Operation Flood and other dairy development programmes implemented by the central and the state governments, while growth in poultry sector can be attributed to a large part to the private poultry industry initiatives. The development of poultry industry in India within a span of just two decades is remarkable. From rural backyard poultry production catering to the domestic market prior to the 1980s, the sector has transformed itself into advanced industrial production in some states.

It has long been recognized that women have an important role in livestock production, care and management and in the processing and

sale of livestock production. In this sector, women's work includes collection of fodder and water, cooking grains for cattle, preparation of concentrate feed for animals, feeding the animals, cleaning and washing cattle shed, cleaning and bathing animals, milking, preparation of milk products, taking the animals for roadside grazing, management and marketing of milk, collection of cow-dung, preparation of cow-dung cakes and their storage, and preparing manure for the farm. Though more than 95% of the work related to animal care is preformed by feminine gender, they do not own cows.

The Bundelkhand region comprising of parts of Uttar Praddesh (Banda, Jalaun, Hamirpur, Jhansi, Lalitpur, Mahoba and Chitrkoot district) and M.P.(Datia,Tikamgarh,Chhatarpur,Panna) India has a semiarid environment and is predominantly an agricultural economy. Bundelkhand has 9.2 million livestock (cattle, Buffalo, Goat, and sheep are 5.4, 1.6, 1.8 and 0.4 million, respectively) population, which is one of the densest in terms of livestock per unit of cultivated land. Average size of the land holding in Bundelkhand is 1.28 ha. Of which most of them are marginal farmer who dependent wholly or partially on livestock farming of the available land less then 1% is used for the cultivation of fodder crops and majority of the fodder fed to the livestock being sourced from the crop residues. About 19.87-lakh ha. of land is available for grazing of the 30.16-lakh adult cattle units (ACU) in Bundelkhand region. Average production of forage from this grazing area is less than 21/ha/year, which is not even sufficient for one adult cattle unit (ACU) as the normal requirement is 2.55/year. Livestock production in this region heavily depends on traditional feeding methods including most common “**Anna Pratha**”. Further,

sustained and high production growth rates, combined with limited and rapidly diminishing land holds and land for food grains and cash crops led to shortage of feed and fodder to livestock in this region, which resulted in over grazing of the available land and practice of “**Anna Pratha**”. The over grazing pressure (ACU/ ha) was 4.74 in UP part of Bundelkhand. While it was 2.84 in the MP. part. To over come this problem, efforts are necessary to increase forage production through establishment of proven silvipastoral systems on waste and community land. It produces 4.61 of forage (ha/year) and further practice of rotational grazing will allow belittling damage due to grazing and fulfilling the feeding requirements of livestock.

OBJECT OF THE STUDY: -

Keeping the above consideration in mind, the present study has been conducted with the following specific objectives: -

- a. To study of nature and extent of co-operative dairy enterprise in village of Bundelkhand region of Uttar Pradesh.
- b. To analysis cost and return per unit [per litter] of milk in Bundelkhand region.
- c. To examine comparative socio-economic aspects co-operative and non-cooperative dairy enterprising women in Bundelkhand Region of Uttar Pradesh.

- d. To examine marketable surplus and different channels used in marketing of milk and its production Jhansi district.
- e. To suggest remedies and measures for stream ling the adoption of dairy innovation in order to uplift the economy of dairy.

HYPOTHESIS OF THE STUDY: -

Keeping in view the objectives of the present study the following hypothesises have been formulated: -

- a The main source of Income livestock and dairy enterprise after agriculture crops in different source of income in Bundelkhand Region.
- b Per unit Expenditure decrease to milk production along with size increase of farm unit.
- c Participation of women more than man in dairy enterprise.
- d The share increases in consumer value to productive along with decrease to arbitrator in different channel of milk marketing.
- e Milk and milk product, production and consumption increase along with farm area increase.

METHOD OF THE STUDY:-

1) SAMPLING DESIGNS: -

A multi-stage stratified random sampling design has been adopted to select districts, block, villages and dairy household.

(a) SELECTION OF DISTRICT: -

The study was conducted in Jhansi district of Bundelkhand region. Jhansi district was selected randomly it represent Bundelkhand region. The cropping intensity of the Jhansi district was 120% in the year 2000-01.

(b) SELECTION OF BLOCK: -

First of all, a list of block of Jhansi district was taken from C.D.O. office, Jhansi. There were 8 blocks in Jhansi viz. Baragaon, Bavina, Month, Chirgaun, Bamaur, Gursaray, Bangra and Mauranipur. Out of these 8 blocks, two block were selected randomly viz Mauranipur and Gursaray.

(c) SELECTION OF VILLAGES: -

First of all, the list of village falling in Mauranipur block taken from B.D.O.offices. The total number of villages in the block

was 83. Simultaneously from block Gursaray also taken a list of villages was taken there were 103 villages falling in the block. All the villages were arranged in alphabetical order. Then a sample of 4 villages, two from block was taken. Hence two villages namely Bhitara and Tejpura were selected randomly from Mauranipur block. Similarly from block Gursaray two villages namely KedarTai and Bagroni Jageer were selected randomly for the present study. "Thus 4 villages selected for the study".

(d) SELECTION OF SAMPLE FARMER: -

A list of all the growers of milk with their owned holdings was prepared for the selected villages. The total number of growers in the four selected villages was about 600. Then the farmers were categorized into four-farm size group viz. marginal (0-1 hectares), small (1-2 hectares), medium (2-4 hectares) and large (Above 4 hectares). The number of farmers falling in marginal, small, medium and large farm size groups came 300, 150, 100 and 50 respectively. After doing so, a sample of 120 cases was taken randomly. The final selection was made from the different strata based on production to its size. Thus 60 cases in marginal, 30 in small, 20 in medium and 10 in large farm size group were selected for the present study randomly as show by the table No. 2:1.

Table No. 2:1 case selected for the present study

S.No.	Size group	Total No. of cases	Cases selected
1.	Marginal (0-1 hect.)	300	60
2.	Small (1-2 hect.)	150	30
3.	Medium (2-4 hect.)	100	20
4.	Large (< 4 hect.)	50	10
5.	Total	600	120

(e) SELECTION OF MILK MARKETING AGENCIES: -

1. Milkman → Consumer.
2. Milkman → Halwai → Consumer.
3. Milkman → Vender → Consumer.
4. Milkman → Milk Co-operative Society → Consumer.
5. Milkman → Vender → Milk Co-operative Society → Consumer.
6. Milkman → Milk Co-operative Society → Co-operative plant → Consumer.

2) COLLECTION OF DATA: -

The present study was based on primary as well as secondary data. The primary data were collected through well prepared Schedules and Questionnaires. A pilot survey was conducted to test the schedule and questionnaire. The whole primary data were collected within three or four meetings with the respondents. The secondary data were recorded from the record of different marketing agencies. The primary data relate to year 2002- 2003.

3) SOURCE OF DATA: -

The data to be used have been two types viz.

I. Primary data: -

“The primary data is one which is collected by the investigator himself for the first time.”

The primary data were gathered through preproposed Schedules and Questionnaire by personal interview

II. Secondary data: -

“Data which are obtained from published or unpublished sources are known as secondary data.”

a) **PUBLISHED SOURCES: -**

There are certain international, national and local agencies, which publish statistical data on a regular basis.

- Statistical Year Book,
- Indian Journal of Agricultural Economics,
- Yojana,
- Kurukshetra
- Committee Reports,
- Private Publication,
- Newspapers and Magazines,
- Individual Research Scholars, etc.

b) **UNPUBLISHED SOURCES: -**

There are various sources of unpublished data such as the records maintained by the various governments and private offices, B.D.O. office, Agricultural office, Dairy coo-perative office studies made by the Research Scholars in the universities and other research institutions, etc.

4. **METHODS OF ANALYSIS: -**

(A). Estimation of cost of Production of milk.

(a) **Evaluation of cost item: For cost of Milk Estimation:**

i.) FAMILY LABOUR: -

The family labour was charge at the wage rate prevailing the locality for permanent hired labour i.e. Rs. 10/ per labour per day.

ii.) MILK PRODUCTION: -

The milk production was evaluated at the rate of the price prevailing during the period in the village i. e. about Rs. 8 per litre of milk.

iii.) EXCHANGE LABOUR: -

The exchange labour was treated as family labour was treated as family labour was evaluated at the simple rate at which the family labour was evaluated i.e. Rs. 10 per labour per day.

(B) COST OF PRODUCTION PER LITRE OF MILK: -

The total cost, which includes variable cost and fixed cost, was estimated. There are two methods for apportionment of total cost among the main and by product.

i. PROPORTIONATE METHOD: -

Under this method, the total cost of milk was divided in the ratio of the value of main product and by product is estimated separately.

ii. DEDUCTIVE METHOD: -

Under this method, the value of by product is deducted from the total cost of milk production. Then the remaining cost is divided by the amount of main product to calculate the cost of production per litre.

In present study the proportionate method has been used to calculate the cost of production of milk.

5. STATISTICAL TECHNIQUES TO BE USED: -

Tabular analysis has been mode analysis of data. Ratio, percentage, Weighted, average, mean, statistical deviations etc. have also been calculated for the presentation.

The overall average, the proportion of various category of dairy household of marginal farmer, small farmer, medium farmer and large farmer came to 60 (50.00 percent), 30 (25.00 percent), 20 (16.67 percent) and 10 (8.33 percent) respectively.

The overall average size of family during the year 2002-03 was come to 5.12. It comprises family size of Adult-male-1.47, female-1.34 and children- male-1.29 and female-1.02. In case of co-operative dairy household and non-co-operative dairy household, family size was came to 4.98 and 5.27 respectively. It can be conclude that average size of family

was small in case of co-operative dairy household compare to non-cooperative dairy households.

The overall average sex ratio, during the year 2002-03 was came to 854.98. In case of co-operative dairy household and non-co-operative dairy household, sex ratio came to 868.75 and 869.82 respectively. In case of co-operative dairy household, the average sex ratio of marginal farmer, small farmer, medium farmer and large farmer was came to 909.09, 829.27, 800.00 and 882.35 respectively. In case of non-cooperative dairy household, the average sex ratio of marginal farmer, small farmer, medium farmer and large farmer was came to 908.16, 837.84, 863.64 and 666.67 respectively. The sex ratio came to low in both case of co-operative & non-cooperative dairy household in compare to National sex ratio i.e. 933.

The overall average, participation of women in different dairy activities- like milking, feeding, grazing, breeding, water drinking, cleaning, supervision, maintenance of cattle shed and dung-cake making came to 22.50 percent, 83.75 percent, 84.58 percent, 75.83 percent, 91.25 percent, 100.00 percent and 53.33 percent respectively. In case of co-operative dairy household, participation of women in different dairy activities of marginal farmer, small farmer, medium farmer and large farmer came to 79.00 percent, 67.33 percent, 54.00 percent and 34.00 percent respectively. In case of non-co-operative dairy household, participation of women in different dairy activities of marginal farmer, small farmer, medium farmer and large farmer came to 80.81 percent,

66.36 percent, 57.50 percent and 38.75 percent respectively. It can be conclude that, average participation of women in different dairy activities decrease with their farm size in both case of co-operative dairy household & non-cooperative dairy household.

With regard to time spent, the result of the present study indicates that maximum time was spent in weeding (236.46 hrs/year) followed by harvesting (132.31 hrs/year), sowing (75.04 hrs/year) and manuring (60.53 hrs/year).

The overall average literate family member during the year 2002-03 was come to male-2.01 (72.18 percent), female-1.65 (69.61 percent). In case of co-operative dairy households, the literate male and female of marginal farmer, small farmer, medium farmer and large farmer came to male 1.88 (71.50 percent) and female 1.61 (69.00 percent), male 1.97 (72.33 percent) and female 1.59 (70.10 percent), male 1.98 (75.50 percent) and female 1.28 (71.00 percent) and male 2.57 (75.59 percent) and female 2.17 (72.50 percent). In case of non-co-operative dairy household, literate male and female of marginal farmer, small farmer, medium farmer and large farmer came to male 1.87 (70.00 percent) and female 1.64 (69.92 percent), male 2.39 (71.50 percent) and female 1.94 (68.80 percent), male 1.99 (72.61 percent) and female 1.64 (69.00 percent) and male 2.22 (74.00 percent) and female 1.43 (71.40 percent) respectively.

The overall average illiterate family member during the year 2002-03 was come to male-0.78 (27.82 percent), female-0.71 (30.39 percent). In case of co-operative dairy household and non-co-operative dairy household, illiterate family member came to 0.72 (26.76 percent), female-0.69 (30.08 percent) and 0.83 (28.80 percent), female-0.74 (30.46 percent) respectively. The study revealed that average literacy rate was high in case of male in compare to female. Average literacy increased with their farm size in both cases of co-operative & non-cooperative dairy households. In case of non-co-operative dairy households average literacy rate was increased at lower rate compare to co-operative dairy households.

The group wise literacy of family member it can be divided into three-group 1- Up to 5th, 2- 5th to 10th and 3- above 10th in different category of co-operative and non-cooperative dairy household The overall group wise literacy of family member during the year 2002-03 was came to Up to 5th male 104.95 person (43.43 percent) and female 104.76 person (53.03 percent), 5th to 10th male 95.15 person (39.37 percent) and female 88.43 person (44.76 percent) and above 10th male 41.55 person (17.02 percent) and female 4.37 person (2.21 percent). It can be concluded that, maximum literate family member was group 1st (Up to 5th) followed by group 2nd (5th to 10th) and group 3rd (above 10th). The women literacy percentage was low comparing to man.

The economic category during the year 2002-03 of co-operative & non-cooperative dairy household according to land holdings.” The

economic categories show the land holding of the farmers.”

The farmers may be classified in the 4 categories according to their holdings. Viz. Marginal farmer ($0 < 1$ ha.), Small farmer (1-2 ha.), Medium farmer (3-4 ha.) and Large farmer ($4 >$ ha.). In case of co-operative & non-cooperative dairy household, of marginal farmer, small farmer, medium farmer and large farmer were came to 50.00 percent, 25.00 percent, 16.67 percent and 8.33 percent respectively. Thus, majority of the farmer marginal farmers followed by small farmers both of farmers were 75 percent of the total no. of dairy household.

The operational holding during the year 2002-03 per family in different category of co-operative & non-cooperative dairy household according to land holdings. In case of co-operative & non-cooperative dairy household, the all-average area owned, cultivated area, irrigate area and unirrigate area was came to 1.7216 ha. and 1.2647 ha. 1.6598 ha. and 1.397 ha. 1.5354 ha. (92.50 percent) and 1.28 ha. (91.62 percent) and 0.1244 ha. (7.50 percent) and 0.117 ha. (8.38 percent). As a result that, the land holding increased in both cases of co-operative & non-cooperative dairy household with there farm size.

The social category during the year 2002-03 of dairy household in Bundelkhand Region. The table revealed that, major part of dairy household was from Schedule cast / Schedule tribes (SC / ST) and Other backward who, as about 46.67 percent and 42.50 percent only 9.17 percent out of total dairy household were belong to general category. It

can be conclude that majority of the dairy household was belong to SC / ST followed by OBC and General.

The overall average no. of milch animal during the year 2002-03 came to 2.01. In case of co-operative dairy household, the number of buffalo and cow came to 1.55 (79.49 percent) and 0.4 (20.51 percent) respectively. In case of non-co-operative dairy household, the number of buffalo and cow came to 1.51 (73.39 percent) and 0.55 (26.61 percent) respectively. Thus, proportionately more no. of buffaloes in comparison to cow were maintained by the dairy households. The studies further conclude that proportion of buffaloes in the milch animal was comparatively higher in case of co-operative dairy households.

The overall average, value of per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.7273, Rs. 9439.74, Rs. 12558.69 and Rs. 13016.13 respectively. In case of co-operative dairy household, value of per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.7719.51, Rs. 9784.21, Rs. 13204.35 and Rs. 14173.33 respectively. In case of non-co-operative dairy household, value of per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.6866.67, Rs.9112.5, Rs. 11913.04 and Rs. 11931.25 respectively. The study revealed that per milch animal value was higher in case of co-operative cooperative dairy household and it increased in both cases with the size of holding.

The overall average, milk production *per milch animal* during the year 2002-03 was come to 1332.66 litres per annum. Average milk production per milch animal in case of co-operative & non-co-operative dairy household, 1423.78 litres and 1246.68 litres respectively per annum. In case of co-operative dairy household milk production per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to 1273.8 litres, 1365.1 litres, 1609.65 litres and 1697.25 litres respectively. In case of non-cooperative dairy household milk production per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to 1095 litres, 1135.15 litres, 1500.15 litres and 1587.75 litres respectively. It can be concluded that, milk production per milch animal was higher in case of co-operative dairy household and it increased with their farm size in both cases co-operative & non-co-operative dairy households.

The overall average, milk production *per farmer* during the year 2002-03 was come to 2676.42 litres per annum. Average milk production per farmer in case of co-operative & non-co-operative dairy household, 2776.37 litres and 2576.47 litres respectively per annum. In case of co-operative dairy household milk production per farmer of marginal farmer, small farmer, medium farmer and large farmer came to 1740.92 litres, 3458.25 litres, 3702.19 litres and 5091.75 litres respectively. In case of non-cooperative dairy household milk production per farmer of marginal farmer, small farmer, medium farmer and large farmer came to 1642.5 litres, 3027.07 litres, 3450.34 litres and 5080.8 litres respectively. It can

be concluded that, milk production per farmer was higher in case of co-operative dairy household and it increased with their farm size in both cases co-operative & non-co-operative dairy households.

The overall average, milk production, consumption and marketed surplus *per farmer* came to 7.33 litres, 2.40 litres (32.74 percent) and 4.93 litres (67.26 percent) respectively per day. In case of co-operative dairy household, milk production, consumption and marketed surplus of marginal farmer, came to 4.77 litres, 1.77 (37.11 percent) 3 litres (62.89 percent) respectively. In case of small farmer, milk production 9.47 litres, consumption 3 (31.68 percent) and marketed surplus came to 6.47 litres (68.32 percent). In case of medium farmer milk production 10.14 litres, consumption 3.14 (30.97 percent) and marketed surplus came to 7 litres (69.03 percent). In case of large farmer, milk production 13.95 litres, consumption 4.95 (35.48 percent) and marketed surplus came to 9 litres (64.52 percent) per day. In case of non-cooperative dairy household, milk production, consumption and marketed surplus of marginal farmer, came to 4.50 litres, 1.52 (33.33 percent) and 3 litres (66.67 percent) respectively. In case of small farmer, milk production 8.29 litres, consumption 2.29 litres (27.62 percent) and marketed surplus came to 6 litres (72.38 percent). In case of medium farmer milk production 9.45 litres, consumption 3.00 (31.74 percent) and marketed surplus came to 6.45 litres (68.26 percent). In case of large farmer, milk production 13.92 litres, consumption 4.92 (35.35 percent) and marketed surplus came to 9.00 litres (64.65 percent) per day. The study revealed that, the average milk production, consumption and marketed surplus increased with their

farm size in both cases co-operative & non-cooperative dairy household the average milk production, consumption and marketed surplus was higher in case of co-operative dairy household in compare to non-cooperative dairy household.

The overall average, season wise milk production *per milch animal* during the year 2002-03 in rainy season, winter season and summer season was came to 413.12 litres (31.00 percent), 568.95 litres (43.44 percent) and 340.49 litres (25.56 percent) respectively per annum. In case of co-operative dairy household, season wise milk production per milch animal of rainy season, winter season and summer season was came to 440.23 litres (30.92 percent), 619.78 litres (43.53 percent) and 363.77 litres (25.55 percent) respectively per annum. In case of non-co-operative dairy household, season wise milk production per milch animal of rainy season, winter season and summer season was came to 387.72 litres (31.10 percent), 540.43 litres (43.35 percent) and 318.53 litres (25.55 percent) respectively per annum. It can be concluded that, highest milk production was came during winter season followed by rainy season and lowest milk production came during in summer season in both cases of co-operative & non-cooperative dairy household.

The overall average, season wise milk production *per farmer* during the year 2002-03 in rainy season, winter season and summer season was came to 8296.91 litres (31.00 percent), 1162.64 litres (43.44 percent) and 6864.84 litres (25.56 percent) respectively per annum. In case of co-operative dairy household, season wise milk production per farmer of

rainy season, winter season and summer season was came to 858.45 litres (30.92 percent), 1208.55 litres (43.53 percent) and 709.36 litres (25.55 percent) respectively per annum. In case of non-co-operative dairy household, season wise milk production per farmer of rainy season, winter season and summer season was came to 801.25 litres (31.10 percent), 1116.9 litres (43.35 percent) and 658.29 litres (25.55 percent) respectively per annum. It can be concluded that, highest milk production came in winter season followed by rainy season and the lowest milk production in summer season in both cases of co-operative & non-cooperative dairy household.

The overall average, cost of milk production per litre was came to Rs. 7.00. In case of co-operative dairy household, average cost of milk production per litre of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 7.10, Rs. 7.11, Rs. 7.09 and Rs. 7.09 respectively. In case of non-cooperative dairy household, average cost of milk production per litre of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 7.12, Rs. 7.12, Rs. 7.11 and Rs. 7.11 respectively. It can be conclude that milk production per litres more and less it in all cases different category of dairy households.

The distribution of milk through marketing channel 1st came to 53928.8 litres (25.00 percent), channel 2nd 47543.61 litres (22.03 percent), channel 3rd 53325.49 litres (24.71 percent) and channel 4th 60960.88 litres (28.26 percent) per annum. In case of marginal farmer milk production of channel 1st, 2nd, 3rd and 4th came to 21116.44 litres (32.55 percent),

16925.90 litres (25.85 percent), 7791.80 litres (11.90 percent) and 19643.21 litres (30.00 percent) respectively per annum. In case of small farmer milk production of channel 1st, 2nd, 3rd and 4th came to 17707.78 litres (25.52 percent), 16471.24 litres (24.11 percent), 17256.89 litres (25.26 percent) and 16881.14 litres (24.71 percent) respectively per annum. In case of medium farmer milk production of channel 1st, 2nd, 3rd and 4th came to 8491.88 litres (17.29 percent), 10161.77 litres (20.69 percent), 16217.57 litres (33.02 percent) and 14243.18 litres (29.00 percent) respectively per annum. In case of large farmer milk production of channel 1st, 2nd, 3rd and 4th came to 6612.70 litres (20.13 percent), 3984.70 litres (12.13 percent), 12059.23 litres (36.71 percent) and 10193.35 litres (31.03 percent) respectively per annum. A perusal of the table distribution of milk marketing agencies *per farmer* revealed that Channel 4th was more efficient in compares to others. The table further reveals that 1st, 2nd and 3rd Channels more or less equally efficient.

The overall average, maintenance cost *per milch animal* during the year 2002-03 came to Rs. 9900.35 per annum. In case of co-operative dairy household the average maintenance cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 9450, Rs. 10145, Rs. 11860 and Rs. 12520 respectively. In case of non-cooperative dairy household the average maintenance cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 8200, Rs. 8495, Rs. 11115 and Rs. 11750 respectively. It can be concluded that, maintenance cost per milch animal increased in both cases of co-operative & non-cooperative dairy household with their farm

size. The table further revealed that maintenance cost came higher in case of co-operative dairy household.

The overall average, maintenance cost *per household* during the year 2002-03 came to Rs. 19883.21 per annum. In case of co-operative dairy household the average maintenance cost per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs 12915, Rs.25700.67, Rs. 27278 and Rs. 37560 respectively. In case of non-cooperative dairy household the average maintenance cost per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 12300, Rs. 22653.33, Rs. 25564.5 and Rs. 37600 respectively. It can be concluded that, maintenance cost per farmer increased in both cases of co-operative & non-cooperative dairy household whilet higher maintenance cost in case of co-operative dairy household compare to non-cooperative dairy households.

The overall average, net-maintenance cost *per milch animal* during the year 2002-03 came to Rs. 9474.56 per annum. In case of co-operative dairy household the average net-maintenance cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 9040, Rs. 9710, Rs. 11410 and Rs. 12030 respectively. In case of non-cooperative dairy household the average net-maintenance cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 7800, Rs. 8085, Rs. 10680 and Rs. 11300 respectively. It can be concluded that, net-maintenance cost per milch animal increased with their land holding in both cases of co-operative & non-cooperative dairy

household but it higher in case of co-operative dairy household than non-cooperative dairy household.

The overall average, net-maintenance cost *per household* during the year 2002-03 came to Rs. 19028.07 per annum. In case of co-operative dairy household the average net-maintenance cost per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 12354.67, Rs. 24598.67, Rs. 26243 and Rs. 36090 respectively. In case of non-cooperative dairy household the average net-maintenance cost per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 11700, Rs. 21560, Rs. 24564, and Rs. 36160 respectively. It can be concluded that, net-maintenance cost per farmer increased in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household than non-cooperative dairy household.

The overall average, variable cost *per milch animal* during the year 2002-03 came to Rs. 7886.75 per annum. In case of co-operative dairy household the average variable cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.7525.98, Rs.8085.56, Rs. 9447.68 and Rs. 9974.68 respectively. In case of non-cooperative dairy household the average variable cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.6534.58, Rs.6765.42, Rs. 8851.99 and Rs. 9356.52 respectively. It can be concluded that, variable cost *per milch animal* increased with their size of holding in both cases of co-operative & non-cooperative dairy

households. It came higher in case of co-operative dairy household in compare to non-cooperative dairy household.

The overall average, fixed cost per milch animal during the year 2002-03 came to Rs. 1357.95 per annum. In case of co-operative dairy household the average fixed cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.1924.02, Rs. 2059.43, Rs. 2412.32 and Rs. 2545.31 respectively. In case of non-cooperative dairy household the average fixed cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 1665.42, Rs.1729.58, Rs. 2263.01 and Rs. 2393.47 respectively. It can be concluded that, fixed cost per milch animal increased with their farm size in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household in compare to non-cooperative dairy household.

The average feed cost per milch animal, came to green fodder Rs.1802.77, dry fodder Rs. 3348.84 and concentrate Rs. 982.06 per annum. In case of co-operative dairy household the average feed cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to green fodder Rs.1717.79, dry fodder Rs. 3189.59 and concentrate Rs. 935.43, green fodder Rs.1868.46, dry fodder Rs. 3470 and concentrate Rs. 1016.85, green fodder Rs. 2188.44, dry fodder Rs. 4064.89 and concentrate Rs. 1192.88 and green fodder Rs. 2324.26, dry fodder Rs. 4323.16 and concentrate Rs. 1269 per annum. In case of non-cooperative dairy household the average feed cost per milch animal of

marginal farmer, small farmer, medium farmer and large farmer came to green fodder Rs. 1456.30, dry fodder Rs. 2704.56 and concentrate Rs.792.54, green fodder Rs. 1501.46, dry fodder Rs. 2788.43 and concentrate Rs.817.12, green fodder Rs. 2078.33, dry fodder Rs. 3860.36 and concentrate Rs. 1132.86 and green fodder Rs.2152.75, dry fodder Rs.4004.15 and concentrate Rs. 1175.36 per annum. The study revealed that, feed cost *per milch animal* increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household.

The overall average, labour cost *per milch animal* during the year 2002-03 came to Rs. 1470.02 per annum. In case of co-operative dairy household the average labour cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.1417.5, Rs.1440.79, Rs. 1660.4 and Rs. 1690.2 respectively. In case of non-cooperative dairy household the average labour cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.1350.5, Rs.1416.2, Rs. 1460 and Rs. 1679 respectively. It can be concluded that, labour cost *per milch animal* increased with their farm size in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household compare to non-cooperative dairy household.

The overall average, gross income *per milch animal* during the year 2002-03 came to Rs. 15776.26 per annum. In case of co-operative dairy household average gross income per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.15696.2, Rs.

16816.2, Rs. 19765.8 and Rs. 20857 respectively. In case of non-cooperative dairy household, average gross income per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 12445, Rs. 12896.65, Rs. 16936.65 and Rs. 17915.24 respectively. It can be concluded that, gross income *per milch animal* increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

The overall average, gross income *per household* during the year 2002-03 came to Rs. 31683.98 per annum. In case of co-operative dairy household the average gross income per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs.21451.47, Rs. 42601.04, Rs. 45461.34 and Rs. 62571 respectively. In case of non-cooperative dairy household the average gross income per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs.18667.5, Rs.34391.07, Rs. 38954.29 and Rs. 57328.8 respectively. It can be concluded that, gross income per farmer increased with their farm size in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

The overall average, the net return from dairy *per milch animal* during the year 2002-03 came to Rs. 5875,91 per annum. In case of co-operative dairy household average net return from dairy per milch animal of marginal farmer, small farmer, medium farmer and large farmer came

to Rs. 6246.2, Rs. 6671.2, Rs. 7905.8 and Rs. 8337 respectively. In case of non-cooperative dairy household, average net return from dairy per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 4245, Rs.4401.65, Rs. 5821.65 and Rs. 6165.24 respectively. It can be concluded that, net return from dairy per milch animal increased with their farm size in both cases of co-operative & non-cooperative dairy household but it more in case of co-operative dairy household compare to non-cooperative dairy household.

The overall average, net return from dairy per household during the year 2002-03 came to Rs. 11800.77 per annum. In case of co-operative dairy household the average net return from dairy per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 8536.47, Rs.16900.37, Rs. 18183.34 and Rs. 25011 respectively. In case of non-cooperative dairy household the average net return from dairy per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 6367.5, Rs. 11737.74, Rs. 13389.79 and Rs. 19728.8 respectively. It can be concluded that, net return from dairy per farmer increased with their farm size in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household compare to non-cooperative dairy household.

The overall average, the gross margin *per milch animal* during the year 2002-03 was came to Rs. 12009.57 per annum. In case of co-operative & non-co-operative dairy household, the all-average gross margin per milch animal was came to Rs. 13568.60 & Rs. 10538.54

respectively per annum. It can be concluded that, gross margin per milch animal was increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

The overall average, input-output ratio *per milch animal* during the year 2002-03 came to Rs. 1.593. In case of co-operative dairy household input-output ratio *per milch animal* of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 1.661, Rs. 1.657, Rs. 1.666 and Rs. 1.666 respectively. In case of non-cooperative dairy household, input-output ratio *per milch animal* of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 1.518, Rs. 1.518, Rs. 1.524 and Rs. 1.525 respectively. It can be concluded that, input – output ratio was higher in case of co-operative dairy household compared to non-co-operative dairy household.

CONCLUSION

1. The overall average, the proportion of various category of dairy household of marginal farmer, small farmer, medium farmer and large farmer came to 60 (50.00 percent), 30 (25.00 percent), 20 (16.67 percent) and 10 (8.33 percent) respectively.
2. The average size of family was small in case of co-operative dairy household compare to non-cooperative dairy households.

3. The sex ratio came to low in both case of co-operative & non-cooperative dairy household in compare to National sex ratio i.e. 933.
4. The average participation of women in different dairy activities decrease with their farm size in both case of co-operative dairy household & non-cooperative dairy household.
5. With regard to time spent, the result of the present study indicates that maximum time was spent in weeding (236.46 hrs/year) followed by harvesting (132.31 hrs/year), sowing (75.04 hrs/year) and manuring (60.53 hrs/year).
6. The study revealed that average literacy rate was high in case of male in compare to female. Average literacy increased with their farm size in both cases of co-operative & non-cooperative dairy households. In case of non-co-operative dairy households average literacy rate was increased at lower rate compare to co-operative dairy households.
7. It can be concluded that, maximum literate family member was group 1st (Up to 5th) followed by group 2nd (5th to 10th) and group 3rd (above 10th). The women literacy percentage was low comparing to man.

8. The majority of the farmer marginal farmers followed by small farmers both of farmers were 75 percent of the total no. of dairy household.
9. As a result that, the land holding increased in both cases of co-operative & non-cooperative dairy household with there farm size.
10. It can be conclude that majority of the dairy household was belong to SC / ST followed by OBC and General.
11. Thus, proportionately more no. of buffaloes in comparison to cow were maintained by the dairy households. The studies further conclude that proportion of buffaloes in the milch animal was comparatively higher in case of co-operative dairy households.
12. The study revealed that per milch animal value was higher in case of co-operative cooperative dairy household and it increased in both cases with the size of holding.
13. It can be concluded that, milk production *per milch animal* was higher in case of co-operative dairy household and it increased with their farm size in both cases co-operative & non-co-operative dairy households.
14. It can be concluded that, milk production *per household* was higher in case of co-operative dairy household and it increased with their

farm size in both cases co-operative & non-co-operative dairy households.

15. The study revealed that, the average milk production, consumption and marketed surplus increased with their farm size in both cases co-operative & non-cooperative dairy household the average milk production, consumption and marketed surplus was higher in case of co-operative dairy household in compare to non-cooperative dairy household.

16. It can be concluded that, highest milk production was came during winter season followed by rainy season and lowest milk production came during in summer season in both cases of co-operative & non-cooperative dairy household.

17. It can be concluded that, highest milk production came in winter season followed by rainy season and the lowest milk production in summer season in both cases of co-operative & non-cooperative dairy household.

18. It can be conclude that milk production per litres more and less it in all cases different category of dairy households.

19. A perusal of the table distribution of milk marketing agencies *per farmer* reveled that Channel 4th was more efficient in compares to

others. The table further reveals that 1st, 2nd and 3rd Channels more or less equally efficient.

20. It can be concluded that, maintenance cost *per milch animal* increased in both cases of co-operative & non-cooperative dairy household with their farm size. The table further revealed that maintenance cost came higher in case of co-operative dairy household.
21. It can be concluded that, maintenance cost *per household* increased in both cases of co-operative & non-cooperative dairy household while higher maintenance cost in case of co-operative dairy household compare to non-cooperative dairy households.
22. It can be concluded that, net-maintenance cost *per milch animal* increased with their land holding in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household than non-cooperative dairy household.
23. It can be concluded that, net-maintenance cost *per household* increased in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household than non-cooperative dairy household.
24. It can be concluded that, variable cost *per milch animal* increased with their size of holding in both cases of co-operative & non-

cooperative dairy households. It came higher in case of co-operative dairy household in compare to non-cooperative dairy household.

25. It can be concluded that, fixed cost *per milch animal* increased with their farm size in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household in compare to non-cooperative dairy household.

26. The study revealed that, feed cost *per milch animal* increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household.

27. It can be concluded that, labour cost *per milch animal* increased with their farm size in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household compare to non-cooperative dairy household.

28. It can be concluded that, gross income *per milch animal* increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

29. It can be concluded that, gross income *per household* increased with their farm size in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

30. It can be concluded that, net return from dairy *per milch animal* increased with their farm size in both cases of co-operative & non-cooperative dairy household but it more in case of co-operative dairy household compare to non-cooperative dairy household.

31. It can be concluded that, net return from dairy *per household* increased with their farm size in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household compare to non-cooperative dairy household.

32. It can be concluded that, gross margin *per milch animal* was increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

33. It can be concluded that, input – output ratio was higher in case of co-operative dairy household compared to non-co-operative dairy household.

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APPENDIX

APPENDIX-1



Title

**"ROLE OF CO-OPERATIVE DAIRY ENTERPRISE IN THE RURAL
DEVELOPMENT THROUGH PARTICIPATION OF WOMEN
IN JHANSI DISTT. OF BUNDELKHAND REGION OF U. P."
(AN ECONOMIC ANALYSIS)**

Ph.D. (Research scholar)

Miss Jyoti Yadav

SCHEDULE QUESTIONNAIRES

[A] General information about surveyed village

1. Name of village
2. Post office
3. Block
4. Tehsil
5. District
6. Village attached to Kachcha/Pacca road
7. Transportation facility-Train/Bus/Tonga/Auto/Ricksha
8. Education-Primary J.H./High School / Inter College/ Degree College
9. Co-operative dairy
10. Banking facility
11. S.T.D. /P.C.O.
12. Nearest Railway station
13. Police station

[B] General information of the household

1. Name of head of the family
2. Father's name
3. Economic category-
 - a- Marginal farmer - (0-1 ha.)
 - b- Small farmer- (1-2 ha.)
 - c- Medium farmer- (2-4 ha.)
 - d- Large farmer - (< 4 ha.)

4. Social category-

O.B.C.	Gen	SC/ST
--------	-----	-------

[C] Operational Holding

1. Climate condition.
2. Area owned (ha.).
3. Area leased in (ha.).
4. Area leased out (ha.).
5. Total cultivated area (ha.).
6. Total irrigate area (ha.).
7. Total unirrigate area (ha.).
8. Source of irrigation.

[D] Nature & extent of milch animal

Breed	No.	Value in Rs.	Owne produced	Purchased	Source of Finance
Buffalo					
Cow					
Goat					
Total					

[E] Family Composition

Family-joint ()/ Nucleus ()

[illegible]

[F] Farm Inventory

a: Assets

Particulars	Expected Value in (Rs.)	Future Life
Land		
Building		
Livestock		
Implement of machinery at farm		
Farm Building		

b: Current Assets

Particulars	Amount (Rs.)
Cash in hand	
Cash in bank	
Cash in P.Q.	
L.I.C. Premium paid	
Money given to others	
Total	

[G] Liabilities**1: Rent to be paid**

2: Water change to paid

3: Interest of credit to be paid

4: Revenue to be paid

[H] Milk sold through which channel

1: Milk man → Vender → Consumer

2: Milk man → Hallway → Consumer

3: Milk man → Consumer

4: Milk man → Cooperative society → Consumer

5: Producer → Vender → Coop. Society → Consumer

[I] Production of milk (Month wise)

Month	Total Production of milk		Family requirement		Milk sold during the months		Amount Received
	Litre	Price	Litre	Price	Quantity		Milk sold in Rs.
					Litre	Price	
January							
February							
March							
April							
May							
June							

July							
August							
September							
October							
November							
December							

[J] Participation of women in Dairy enterprise

Particular	Yes/No
Milking	
Feeding	
Grazing	
Breeding	
Water drinking	
Cleaning	
Supervision	
Maintenance of cattle shed	
Dung	
Arrangement	

[K] Maintenance cost per milch animal

Particulars	Unit	Rate	Cost in (Rs.)
[A] Fixed cost			
a: Building (area sq.m. for Buffaloes &Calves			
b: Buffaloes price			
c: Equipment			
1: Chaff cutter			
2: Milk can* & paid			
3: Others			
Interest			
Depreciation			
Repair & Maintenance			
Total			
Particulars	Quantity	Rate	Cost in (Rs.)
[B] Variable cost			
a: Dry fodder			
1:Bhusa			
2:Others			

b: Green fodder			
1: Berseem			
2: Grass			
c: Concentrate			
d: Medicines & Minerals			
Total			
Particulars	Unit	Rate/labour	Cost in (Rs.)
[C] Human Labour			
1: Family Labour			
2: Hired Labour			
3: Others			
Total			
Gross Cost (A+B+C)			
[D] Dung	Wt. (q)/unit	Rate	Cost (Rs.)
[E] Young Stock			
Total			
Net cost (A+B+C) - D+E			

[L] Cropping Pattern

Crops	Area (H.)	Total Production (Q)	Total Value (Rs.)
1. Kharif			
2. Rabi			
3. Zaid			

[M] Source of dairy finance

Source of finance	Amount (Rs.)	Productive purpose Amount purchase	Non-pro. Purpose Amount purchase (Rs.)	Remark
[a] Institutional				
1. Cooperative bank				
2. Commercial bank				
3. Government scheme				
[b] Non Institutional				
1. Ag. Money lender				

2. Prof. Money lender				
3. Traders or commission				
4. Land lord				
5. Relative				
6. Others				

[N] Marketable Surplus

S.N.	Assets particular	Retained for seed	Sold (Q)	Consumption	Rate (Q)	Total Production
1	Food grain					
2	Pulses					
3	Oilseeds					
4	Others					

[O] Constraints faced in Dairy enterprise

(A) Breeding -

You prefer improved breed	Yes/No
From where dairy men purchase improved breed	
Availability of breed	Yes/No
Availability of breed is costlier	Yes/No
Breed management is difficult	Yes/No
If you then what problem faced by the people	
Artificial insemination centers are available for service	Yes/No
Improves varieties are more susceptible to disease	Yes/No

(B) Feeding -

Availability of feed to animal	Home Produced/Purchased
If purchased at appropriate price	Yes/No
Availability of green fodder in Kharif season	Sufficient/Deficient
Availability of green fodder in Rabi season	Sufficient/Deficient
Availability of green fodder in Zaid season	Sufficient/Deficient
How much own feed	
How much feed purchased (q.) _____	@ Rs./Quintal
Do you have knowledge of balanced ration?	Yes/No
How many times you give the fodder to the animal	Once/Twice /Thrice

(C) Management -

Availability of drinking water to animals in summer season	Sufficient/Deficient
Availability of drinking water to animals in winter season	Sufficient/Deficient

How many times you drink the water to the animals?	Once/Twice /Thrice
Appropriate cattle shed is availability to the animal	Yes/No
Have you prefer daily/weekly/monthly bathing to animal	Yes/No
Have you sufficient amount of found to maintenance of the animal	Yes/No
Marketing of the milk & milk products through which agency? _____	
How many months milch animal remains dry? _____	

❖ **Availability of Medicare to animal -**

Location and distance of the vet nary hospital from the village	
Visit of vet nary staff to the village	
Monthly/Seasonally/Never why? Vaccination provided by and govt.	
agency	Yes/No
You prefer the injection to the milch animal	Yes/No
Calf of the buffaloes remains live	Yes/No
Condition of the cattle shed	Yes/No

❖ **Suggestion made by Dairy enterprneurs to make the Dairy business successful**

- I
- II
- III
- IV
- V

APPENDIX-2

List of important cattle and buffalo farms in India

KANKREJ

1. Bidda, Pinjrapole & Gaushala, Mandvi, Dis. Kutch (Gujarat)
2. Bochasanwasi Shree Akshar Purushotam Gaushala Trust, P.O. Bochasan. Dist. Kheda (Gujarat)
3. Cattle Breeding Farm, Bhuj, Dist. Kutch (Gujarat)
4. Cattle Breeding Farm, Mandi, Dist. Surat (Gujarat)
5. Cattle Breeding Farm, Thara, Dist. Banskatha (Gujarat)
6. Livestock Research Station, Dantiwada Campus, Sardar Krushinagar, Gujarat Agricultural University (Gujarat)
7. Mansa Gaushala Trust, Mansa, Dis. Mehsana (Gujarat)
8. Sabarmati Ashram Gaushala, Bidaj Farm P.O. Lali, Dist. Khera (Gujarat)
9. BAIF – Magazari Farm, Tal Sansad, Dist. Ahmedabad (Gujarat)

THARPARKAR

1. Government Livestock Farm, Hisar (Haryana)

2. Central Cattle Breeding Farm (GOI), Suratgarh (Rajasthan)
3. Cattle Breeding Farm, Chandan, Dist. Jaisalmer (Rajasthan)
4. Cattle Breeding Farm, Bharari, Jhansi (U.P.)
5. Cattle Breeding Farm, Pohara, Dist. Amravati (Maharashtra)
6. Cattle Breeding Farm, Yeotmla (Maharashtra)
7. Government Livestock Farm, Mammnoor, Dist. Warangal (A.P.)
8. Cattle Breeding Farm, Chettinad Dist. Madurai (T.N.)
9. Cattle Breeding Farm, Purnia (Bihar)

HARIANA

1. Cattle Breeding Farm, Kumber, Dist. Bharatpur (Rajasthan)
2. Government Livestock Farm, Hisar (Haryana)
3. Sri Gaushala Society (Regd.) Panipat (Haryana)
4. Cattle Breeding Farm, Bahadurgarh, Dist. Meerut (U.P.)
5. Cattle Breeding Farm, Babugarh, Dist. Ghaziabad (U.P.)
6. Cattle Breeding Farm, Bharrari, Jhansi, (U.P.)
7. Cattle Breeding Farm, Hastinapur, Dist. Meerut (U.P.)
8. Cattle Breeding Farm, Niblett – Barabani (U.P.)
9. Cattle Breeding Farm, Nilgaon – Sitapur (U.P.)
10. Cattle Breeding Farm, Saidpur – Lalitpur (U.P.)
11. Cattle Breeding Farm, Kopargaon, Dist. Ahmednagar (A.P.)
12. Cattle Breeding Farm, Nagpur (M.S.)

13. Livestock Farm, Barpeta, Dist. Kamrup (Assam)
14. Livestock Farm, Khanikar, P.O. Sessa, Dist. Dibrugarh (Assam)
15. Livestock Farm, Manja Lumbajang (Assam)
16. Livestock Farm, Guwahati (Assam)
17. Livestock Farm, Pachmile, Napam, Dist. Darrang (Assam)
18. Cattle Breeding Farm, Dumraon (Bihar)
19. Cattle Breeding Farm, Sarakala, Ranchi (Jharkhand)
20. Shree Gaushala, Bhagalpur (Bihar)
21. Cattle Breeding Farm, Imlikhera, Dist. Chhindwara (M.P.)
22. Cattle Breeding Farm, Kiratpur, Dist. Hansi (M.P.)
23. Cattle Breeding Farm, Minora, P.O. Kundeshwar, Dist. Tikamgarh (M.P.)
24. Cattle Breeding Farm, Pakaria, P.O. Bendra Road, Dist. Bilaspur (M.P.)
25. Cattle Breeding Farm, Boudh, Dist. Phulbani (Orissa)
26. Cattle Breeding Farm, Keonjhar (Orissa)
27. Satguru Sewa Singh Farm, Jiwannagar, Sirsa (Haryana)

NAGUARI

1. Cattle Breeding Farm, Nagour (Rajasthan)

ONGOLE

1. Cattle Breeding Farm, Banvasi, Dist. Kurnool (A.P.)
2. Cattle Breeding Farm, Kakinada Dist. East Godavari (A.P.)
3. Cattle Breeding Farm, Kampasagar, Dist. Nalgonda (A.P.)
4. Cattle Breeding Farm, Mahanandi Dist. Kurnool (A.P.)
5. Cattle Breeding Farm, Ramathirthan, Dist. Prakasam (A.P.)
6. Government Dairy Farm, Dist. Visakhapatnam (A.P.)
7. Cattle Breeding Farm, Andhra Pradesh Agricultural University, Lam, Dist. Guntur (A.P.)

RATHI

1. Cattle Breeding Farm, Nohar , Dist. Shree Ganga Nagar (Rajasthan)
2. K.N. College of Agricultural Dairy Farm, Jobner, Dist. Jaipur (Rajasthan)
3. Cattle Breeding Farm, Hingoli, Dist. Parbhani (M.S.)
4. Dairy Farm, Govind Ballabh Pant University of Agricultural and Technology, Pantnagar, Dist. Nainital (Uttaranchal)

GIR

1. Cattle Breeding Farm, Dag, Dist. Jhalawar (Rajasthan)

2. Cattle Breeding Farm, Rajkot (Gujarat)
3. Cattle Breeding Farm, Junagarh (Gujarat)
4. Lok Bharati Gaushala, G B Pant University of Agriculture and Technology, Pantnagar, Dist. Nainital (Uttaranchal)
5. Bombay Pinjrapole Farms at Bhiwandi, Chembur, Lakhivli, Rita, Walsind, Mumbai (M.S.)
6. Cattle Breeding Farm, Kopargaon, Dist. Ahmednagar (M.S.)
7. Nasik Panchwati Pinjrapole, Panchwati, Nasik (M.S.)
8. Pinjrapole Sanstha Sangh, Pet Bagh, Near Ganpati Temple, Sangh (M.S.)
9. College of Veterinary Sciences, Jawaharlal Nehru Krishi Vishwa Vidyalaya, South Civil Lines, Jabalpur (M.P.)
10. Kasturba Gandhi Memorial Trust Gaushala, Kasturbagram, Indore (M.P.)
11. Cattle Breeding Farm, Kopardem, Sattari (Goa)
12. Cattle Breeding Farm, Morvi, Dist. Rajkot (Gujarat)
13. Sabarmati Ashram Gaushala, Bidaj Farm, P.O. Lali, Dist. Khera (Gujarat)
14. Pinjrapole, Bhuleshwae, Mumbai (M.S.)
15. BAIF-Magazari Farm, Tal Sansad, Dist. Ahmedabad (Gujarat)

KHILLAR

1. Cattle Breeding Farm, Hingoli, Dist. Parbhani (M.S.)
2. Cattle Breeding Farm, Junoni, Dist. Solapur (M.S.)
3. Cattle Breeding Farm, Bankapur, Dist. Dharwad (Karnataka)

NIMARI

1. Cattle Breeding Farm, Bod, Dist. Amravati (M.S.)

RED SINDHI

1. Cattle Breeding Farm, Beli Charana, Jammu Cantt. (J. & K.)
2. Cattle Breeding Farm, Kalsi, Dehra Dun (Uttaranchal)
3. Cattle Breeding Farm, Dhat, Sanguem (Goa)
4. Cattle Breeding Farm, Koila Dist. Dakshina Kannada (Karnataka)
5. Cattle Breeding Farm, Kodapanakunnu, Trivendrum (Kerala)
6. Cattle Breeding Farm, Chethnd, Dist. Madurai (T.N.)
7. Cattle Breeding Farm, Orthanad Dist. Thanjavur (T.N.)
8. Cattle Breeding Farm, Pudukkottai (T.N.)
9. Cattle Breeding Farm, Tirunelveli (T.N.)
10. Livestock Farm, Barpeta, Dist. Kamrup (Assam)
11. Livestock Farm, Jagdaur (Assam)
12. Cattle Breeding Farm, Gauikarma, Dist. Hazaribagh (Jharkhand)

13. Central Cattle Breeding Farm, Chiplima, P.O. Basantpur,
Dist. Sambalpur (Orissa)
14. Cattle Breeding Farm, Bolangir (Orissa)
15. Cattle Breeding Farm, Chiplima, P.O. Kalamati, Dist.
Sambalpur (Orissa)
16. Cattle Breeding Farm, Hosur, Dist. Dharampuri (T.N.)

SAHIWAL

1. President's Estate, New Delhi
2. Government Livestock Farm, Hisar (Haryana)
3. National Dairy Research Institute, Karnal (Haryana)
4. Cattle Breeding Farm, Beli Charana, Jammu Cantt. (J. & K.)
5. Amritsar Pinjrapole Gaushala (Regd.) Ghee Mandi. Amritsar
(Punjab)
6. Cattle Breeding Farm, Chak – Ganjaria, Lucknow (U.P.)
7. Cattle Breeding Farm, Bod, Amravati (Maharashtra)
8. Cattle Breeding Farm, Nabha (Punjab)
9. Cattle Breeding Farm, Anjora, Dist. Durg (Chattisgarh)
10. Military Dairy Farm, Meerut (U.P.)
11. Dairy Farm, Govind Ballabh Pant University of Agricultural
& Technology. Pantnagar, Dist. Nainital (Uttaranchal)
12. Satguru Sewa Sangh, Jeevannagar, Sirsa (Haryana)

13. Satguru Sewa Sangh, Banikhurd (Khanna), Dist. Ludhiana (Punjab)

AMRITMAHAL

1. Cattle Breeding Station, Aijampur, Dist. Chikmanglore (Karnataka)
2. Composite Livestock Farm, Hessarghatta, Bangalore

MURRAH BUFFALO

1. Central Institute for research on Buffaloes. Sirsa Road, Hisar (Haryana)
2. National Dairy Research Institute, Karnal (Haryana)
3. Cattle Breeding Farm, Beli Charana, Jammu Cantt. (J. & K.)
4. Government Livestock Farm, Hisar (Haryana)
5. Punjab Agricultural University, Ludhiana (Punjab)
6. Cattle Breeding Farm, Babugarh, Dist. Ghaziabad (U.P.)
7. Cattle Breeding Farm, Bharari – Jhansi (U.P.)
8. Cattle Breeding Farm, Chak Ganjaria, Lucknow (U.P.)
9. Cattle Breeding Farm, Hastinapur, Dist. Meerut (U.P.)
10. Cattle Breeding Farm, Lakhimpur, Dist. Kheri (U.P.)
11. Indian Veterinary Research Institute, Izatnagar (U.P.)
12. Cattle Breeding Farm, Ashwaraopet, Dist. Khammam (A.P.)

13. Government Livestock Farm, Banavasi, Dist. Kurnool (A.P.)
14. Government Livestock Farm, Kakinada, Dist. East Godavari (A.P.)
15. Government Livestock Farm, Mamnoor, Dist. Warangal (A.P.)
16. Government Livestock Farm, Reddipalli, Dist. Anantpur (A.P.)
17. Government Livestock Farm, Viskhapatanam(A.P.)
18. Cattle Breeding Farm, Bankpura, Dist. Dharwad (Karnatake)
19. Cattle Breeding Farm, Kurikuppi, P.O. Toronagalli, Dist. Bellari (Karnatake)
20. Cattle Breeding Farm, Avadi (Akamadhi) (Chennai)
21. Cattle Breeding Farm, Chettinad, Dist. Madurai (T.N.)
22. Cattle Breeding Farm, Orthanad, Dist. Thanjavur (T.N.)
23. Cattle Breeding Farm, Pudukkottai (T.N.)
24. Cattle Breeding Farm, Tirunelveli (T.N.)
25. Livestock Farm, Barpeta, Dist. Kamrup (Assam)
26. Livestock Farm, Berhampur, Dist. Nowgong (Assam)
27. Livestock Farm, Guwahati (Assam)
28. Livestock Farm, Khanikar (Assam)
29. Cattle Breeding Farm, Saria kala, Ranchi (Jharkhand)
30. Cattle Breeding Farm, Sepaya, Ranchi (Bihar)
31. Cattle Breeding Farm, Anjora, Dist. Durg (Chattisgarh)
32. Cattle Breeding Farm, Kiratpur, Dist. Itarsi (M.P.)

33. Cattle Breeding Farm, Ratona, PB-2, Sagar (M.P.)
34. Cattle Breeding Farm, Haringhata (W.B.)
35. Cattle Breeding Farm, Kareemnagar (A.P.)
36. Cattle Breeding Farm, Horesikullu (A.P.)
37. Government Livestock Farm, Khanapara (Assam)
38. Government Livestock Farm, Kaliapani (Assam)
39. Cattle Breeding Farm, Bumraon (Bihar)
40. Livestock Farm, Hessarghatta, Bangalore (Karnataka)
41. Cattle – cum – sheep Breeding Farm, Munirabad (Karnataka)

BHADAWARI BUFFALO

1. Cattle Breeding Farm, Baburagh, Dist. Ghaziabad (U.P.)
2. Cattle Breeding Farm, Saidpur, Dist. Lalitpur (U.P.)
3. Agricultural College Dairy Farm, Kanpur (U.P.)

JAFFARABADI BUFFALO

1. Dairy Farm, Agricultural College, Gujarat Agricultural University, Junagarh Campus (Gujarat)

SURTI BUFFALO

1. Composite Livestock Farm, Dhat, Sangeum. Gao

2. Cattle Breeding Farm, Ode, Anand (Gujarat)
3. Central Cattle Breeding Farm, Dhamrod, Surat(Gujarat)
4. National Dairy Research Institute, Southern Regional Station, Bangalore
5. Dairy Farm, Dharwad Campous, Krishinagar, University of Agricultural Sciences, Dharwad (Karnataka)
6. Buffalo Breeding Farm, Thiruvazhun – Kunnu (Kerala)

NILI – RAVI BUFFALO

1. Military Dairy Farm, Ferozepur (Punjab)
2. Bull Mother Farm & Exotic Cattle Farm, Bhattian (Khanna), Dist. Ludhiana (Punjab)
3. Buffalo Breeding Station, Nabha (Punjab)

JERSEY (EXOTIC) CATTLE

1. Indo – Australian Cattle Breeding Farm, Hisar (Haryana)
2. Model Exotic Animal Farm, Bhiwani (Haryana)
3. Cattle Breeding Farm, Kamand Dist. Mandi (H.P.)
4. Cattle Breeding Farm, Kothipura, Dist. Bilaspur (H.P.)
5. Indo – German Cattel Breeding Farm, Bhangratu Dist. Mandi (H.P.)

6. Indo – New Zealand Project, C/o Himachal Pradesh Agricultural University, Palampur (H.P.)
7. Cattle Breeding Farm, Karsog, Dist. Mandi (H.P.)
8. Cattle Breeding Farm, Beli Charana, Jammu Cantt (J. & K.)
9. Cattle Breeding Farm, Mashal, Dist. Srinagar (J. & K.)
10. Jersey Cattle Breeding Farm, Roper (Punjab)
11. Exotic Nucleus Farm, Bhattian, Khanna (Punjab)
12. Exotic Nucleus Farm, P.O. Bassi, Jaipur (Rajasthan)
13. Cattle Breeding Farm, Kalsi, Dist. Dehara Dun (Uttaranchal)
14. Literacy House Bull Mother Farm, Alambagh, Lucknow (U.P.)
15. Jersey Cattle Breeding Farm, Rai – Bareilli (U.P.)
16. Composite Livestock Farm, Dhat, Sanguem, Goa
17. Cattle Breeding Farm, Ode, Anand (Gujarat)
18. Sabarmati Ashram Gaushala Bidaj Farm P.O. Lali Dist. Khera (Gujarat)
19. Central Cattle Breeding Farm, Urli – kanchan, Dist. Pune (M.S.)
20. Exotic Cattle Breeding Farm, Harsool, Dist. Aurangabad (M.S.)
21. Bull Rearing Centre, Nagpur Lake, Amrohi, Nagpur (M.S.)
22. Exotic Cattle Breeding Farm, Tathawadi, Dist. Pune (M.S.)
23. Exotic Cattle Breeding Farm, Wadsa, Dist. Chandrapur (M.S.)

24. Konkan Development Corporation, Aarey Milk Colony, Mumbai (M.S.)
25. Jersey Farm Nakari Kallu, Dist. Guntur (A.P.)
26. Jersey Cattle Breeding Farm, Banavasi, Dist. Kurnool (A.P.)
27. Cattle Breeding Farm, Kampa Sagar, Dist. Nalgonda (A.P.)
28. Government Dairy Farm, Visakhapatnam (A.P.)
29. Cattle Breeding Farm, Kodapanma Kunnu, Dist. Trivendrum
30. Jersey Cattle Breeding – cum – Crossbreed Farm, Adiparambu, Dist. Trivendrum
31. Jersey Farm, Vithura (Kerala)
32. Cattle Breeding Farm, Eachenkotlai, Dist. Thanjavur (T.N.)
33. Madhavaram Dairy Farm, Chennai (T.N.)
34. Cattle Breeding Farm, Ootacamund, Dist. Nilgiri (T.N.)
35. Cattle Breeding Farm, Orthanaad, Dist. Thanjavur (T.N.)
36. Cattle Breeding Farm, Pudukkottai (T.N.)
37. Madras Christian College Farm, Thambaram, Chennai (T.N.)
38. Nucleus Jersey and Stud Farm, Udhagamandalam, Dist. Nilgiri
39. Livestock Farm, Barpeta, Dist. Kamrup (Assam)
40. Livestock Farm, Guwahati – Khanapara (Assam)
41. Livestock Farm, Berhampur, Dist. Nowgong (Assam)
42. Livestock Farm, Pachmile, Dist. Darrang (Assam)
43. Indo – Australian Cattle Breeding Project, Barpeta (Assam)
44. Exotic Cattle Breeding Farm, Patna (Bihar)

45. Cattle Breeding Farm, Gauriakarma, Dist. Hazaribagh (Jharkhand)
46. Exotic Bull Mother Farm, Vill. Rukka – Hutup, Ranchi (Jharkhand)
47. Cattle Breeding Farm, Bhanolbhada, Bhopal (M.P.)
48. Cattle Breeding Farm, Garhi, Dist. Balaghat (M.P.)
49. Cattle Breeding Farm, Imli Kheda, Chindwara (M.P.)
50. Cattle Breeding Farm, Pakari, Dist. Bilaspur (M.P.)
51. Cattle Breeding Farm, Sarkanda, Dist. Bilaspur (M.P.)
52. Regional Jersey Cattle Breeding Farm, Kyedemkulai (Meghalaya)
53. Central Cattle Breeding Farm, Sunabeda, Dist. Koraput (Orissa)
54. Cattle Breeding Farm, Tadong, Gangtok (Sikkim)
55. Don Basco Mission, Krishnanagar (W.B.)
56. Cattle Breeding Farm, Haringhata, Dist. Nadia (W.B.)
57. State Livestock Farm, Kalyani, Dist. Nadia (W.B.)
58. State Livestock Farm, Kurseong, Dist. Darjeeling (W.B.)
59. Dairy Demonstration Farm, Pedong, Dist. Darjeeling (W.B.)
60. Dairy Demonstration Farm, Ranjitpur, Dist. Darjeeling (W.B.)
61. Exotic Cattle Breeding Farm, Salboni, Dist. Midnapur (W.B.)
62. Dairy Demonstration Farm, Sun, Dist. Midnapur (W.B.)
63. Exotic Cattle Breeding Farm, Santaldih, Dist. Purulia (W.B.)
64. Bull Mother Farm, Kharagpur (W.B.)

HOLSTEIN – FRIESIAN (EXOTIC) CATTLE

1. Indo – Australian Cattle Breeding Farm, Hisar (Haryana)
2. Model Exotic Animal Farm, Bhiwani (Haryana)
3. Cattle Breeding Farm, Bhagthan, Dist. Sirmour (H.P.)
4. Cattle Breeding Farm, Kamand Dist. Mandi (H.P.)
5. Cattle Breeding Farm, Kothipura, Dist. Bilaspur (H.P.)
6. Indo – German Cattel Breeding Farm, Bhangratu Dist. Mandi (H.P.)
7. Cattle Breeding Farm, Karsog, Dist. Mandi (H.P.)
8. Cattle Breeding Farm, Palampur, Dist. Kangra (H.P.)
9. Cattle Breeding Farm, Nabha (Punjab)
10. Cattle Breeding Farm, Mattewara, Ludhiana {Punjab}
11. Sutlei Bed Bet Farm Ropar (Punjab)
12. Exotic Cattle Breeding Farm, Bhattaian (Khanna), Dist. Ludhiana (Punjab)
13. Exotic Nucleus Farm, P.O. Bassi, Jaipur (Rajasthan)
14. Cattle Breeding Farm, Ode, Anand (Gujarat)
15. Kaira District Milk Producers' Co-operative Union Ltd. Kanjari, Dist. Kaira (Gujarat)
16. Lok Bharti Gaushala, P.O. Sanosara, Dist. Bharnjar (Gujarat)
17. Sabarmati Ashram Gaushala Bidaj Farm P.O. Lali Dist. Khera (Gujarat)

18. Central Cattle Breeding Farm, Urli – kanchan, Dist. Pune (M.S.)
19. Konkan Development Corporation, Aarey Milk Colony, Mumbai (M.S.)
20. Cattle Crossbreeding Project, Balsa, Dist. Parbhani (M.S.)
21. Cattle Breeding Farm, Kampasagar, Dist. Nalgonda (A.P.)
22. Cattle Breeding Farm, Redipalli, Dist. Anantpur (A.P.)
23. Dairy & Agricultural Farm, Sanar Nagar, Hyderabad (A.P.)
24. Central Cattle Breeding Farm, Hessarghatta, Bangalore
25. Composite Livestock Farm, Hessarghatta, Bangalore
26. Central Cattle Breeding Farm, Hosur, Dist. Dharampuri (T.N.)
27. Madhavarani Dairy Farm, Chennai (T.N.)
28. Cattle Breeding Farm, Ootacamund, Dist. Nilgiri (T.N.)
29. Cattle Breeding Farm, Orthanad, Dist. Thanjavur (T.N.)
30. Bull Mother Farm, Kharagpur (W.B.)
31. Cattle Breeding Farm, Soro, Dist. Subansiri (Arunachal Pradesh)
32. Cattle Breeding Farm, Tezu, Dist. Lohit (Arunachal Pradesh)
33. Cattle Breeding Farm, Warjung, Dist. Kameng (Arunachal Pradesh)
34. Cattle Breeding Farm, Yazali, Dist. Subansiri (Arunachal Pradesh)
35. Exotic Cattle Breeding Farm, Panta (Bihar)

36. Exotic Cattle Breeding Farm, Rukka-Hutup, Ranchi (Jharkhand)
37. Don Bosco Mission, Krishnagar (W.B.)
38. Cattle Breeding Farm, Haringhata, Dist. Nadia (W.B.)
39. State Livestock Farm, Kalyani, Dist. Nadia (W.B.)
40. State Livestock Farm, Kurseong, Dist. Darjeeling (W.B.)
41. Exotic Cattle Breeding Farm, Salboin, Dist. Midnapur (W.B.)
42. Exotic Cattle Breeding Farm, Santaldih, Dist. Purulia (W.B.)

BROWN SWISS (EXOTIC) CATTLE

1. Government Dairy Farm, Visakhapatnam (A.P.)
2. Indo – Swiss Project, Visakapatnam (A.P.)
3. Cattle Breeding Farm, Kodapanma Kunnu, Dist, Trivendrum
4. Indo – Swiss Project, Munnar (Kerala)

RED DANE (EXOTIC) CATTLE

1. Indo – Danish Cattle Breeding Farm, Hessarghatta, Bangalore
2. Cattle Breeding Farm, Hosur, Dits. Dharampuri (T.N.)

Dairy companies in India

Company	Ownership	Size of dairy Operation in INR (USDmn)	Brands	Major products	Region	Own Milk Infrastructure
Gujarat Cooperative Milk Marketing Federation Lim.	Federation of milk processing in Gujarat	22580(470)	Amul	Butter, cheese, dairy whitener, infant, powder, ethnic products	All India with focus on the west	Yes
(GCMMF)						
Mother Dairy Fruits and Vegetable pvt Lim.	100% owned by National Dairy Development Board	7300(152)	Mother Dairy	Liquid milk, curd, buttermilk, ice cream	Focused on the Delhi area	No (arrangement with cooperative)
Nestle India	Public company, majority stake owned by Nestle SA	8159(170)	Milkmaid Cerelac, Lactogen, Everyday	Sweetened condensed milk, milk powder and dairy whitener, UHT milk infant food	All India	Yes
Dynamix Dairy	Private Company	1996(42)	Contract manufacture for Britannia, Nestle	Butter, ghee, cheese UHT milk		Yes
Hindustan Lever Ltd.	Public company, majority stake owned by Unilever	1564(33)	Kwality Walls	Ice cream	All India	No
Britannia	Minority stake from Danone Recent tie-up with Fonterra	1313(27)	Milkman	Flavoured milk, cheese, butter, ghee	All India	No

Andhra Pradesh Dairy Development Cooperative Federation (APDDCF)	Federation of milk processing Cooperative in Andhra Pradesh	6370(133)	Vijaya	Liquid milk, butter, cheese, ethnic products, ghee, UHT milk	All India with focus on the south	Yes
Hatsun Agro	Public company	1490(31)	Arun	Liquid milk, ice cream ethnic products, Ice cream	South	Yes
Vedilal	Public company	210(4)	Vedilal		West	No
Nilgirts	Private company	600(13)	Nilgirts (sold through own stores, home delivery)	Liquid milk, butte, ghee, cheese flavored milk ethnic products	South	Yes